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Commerce Commission Shown Rates Drive Oil From Railroads

By A. E. Heiss
STAFF REPRESENTATIVE

WASHINGTON, Feb. 25

IN ACCORDANCE with a resolution taken by the American Petroleum Institute months ago, the united industry yesterday and the day before made a concerted drive before the Interstate Commerce Commission for a reduction in freight rates such as the leading men of the industry believe to be necessary to restore it to health and some degree of prosperity. Unlike some of the other big industries, namely, the meat packers, the oil men did not say "if" the commission thought the railroads could stand a reduction in rates they thought the rate making body should put petroleum and its products in the list of things to receive cuts.

They bluntly showed that the railroads, by hoisting their rates, have driven the oil business from the railroads to such an extent that hardly a fourth now moves by rail. They told, with equal bluntness, that unless the railroads and their employees consented to work for more reasonable rates of compensation they would have even less oil to transport than at present. They frankly said that if rates were continued, the industry would be forced, not because it desired so to do, but because it would have to, to extend pipe lines and increase the transportation by motor tanks.

That was not a threat. It was a statement of fact. It meant the industry would have to lose some of its investments in tank cars and supply new money for pipe lines and motors, but that would have to be done if there could be no agreement as to the wages the industry would have to pay to procure the services of the railroads and their employes.

Oil Industry Witnesses

On the first of the two days the witnesses in the petroleum industry's part of the commission's general inquiry into rates, fares and charges of railroads were: R. L. Welch, general secretary and counsel for the American Petroleum Institute; Lacey Walker, statistician for that body; W. H. Reed, of the Union Petroleum Co., as chairman of the institute's rate committee; E. H. Porter, traffic manager for the Atlantic Refining Co., who was presented as the witness who would testify as to rates on short hauls; D. W. Moffitt, vice president of Cosden & Co., who made a special presentation for the industry in Kansas, Oklahoma and Texas; Col. U. G. Lyons, president of the National Petroleum Association, and W. B. Roberts, assistant traffic manager for the Standard Oil Co. of California.

The witnesses scheduled the second day were: A. C. Holmes of the Empire Refineries, Inc.; H. H. Smith, of the Mid-Continent Oil and Gas Association, and F. W. Boltz, the veteran traffic manager for the National Petroleum Association.

The men mentioned, under the guidance of Fayette B. Dow, C. D. Chamberlin and Clifford Thorne, as counsel, brought out the fact collected by the witnesses to show the rate-makers why they should direct the railroads to cut rates.

Rail Attorneys "Amazed"

Because the industry marketed a greater volume of products in 1921 than in 1920, some of the attorneys for the railroads professed to be amazed that an industry that did more business under the rates as advanced in August, 1920, than it did in the year before, should be asking for a reduction in freight charges. M. G. Roberts, attorney for the St. Louis San Francisco, advanced boldly to the cross examination of Secretary Welch as if he thought he was going to have what the women call a lovely time making the witness admit that 1921 was one of the best, if not the best, year the industry had ever had, simply because it had done a large volume of business.

But that is not what he did. On the contrary he was put on the defensive from the start to such an extent that very little cross examination was attempted after Mr. Roberts' essay in that direction. Mr. Roberts tried his scheme of cross examination notwithstanding that if he had paid close attention to one of the first answers Mr. Welch made he might have perceived the cul de sac into which he was walking. One of the first answers Mr. Welch made was that, in his opinion, the industry was over-producing practically every month in 1921 and only came to a near equilibrium in the latter half of the year when the price of Mid-Continent crude rose almost overnight from $1 to $2 a barrel.

"Taken as a whole in 1921, since the increase of August, 1920, the oil industry has had the largest volume of business and profit ever known," interrogatively suggested Mr. Roberts. That was when he exploded a mine under his feet. Mr. Welch had already admitted, in answer to other questions, that about 6 per cent more gasoline was sold in 1921 than in 1920 and perhaps 56 per cent more than in 1919.

Worst Year in Industry

"On the contrary 1921 was the worst year the industry has had," said the witness. "It underwent the most violent price changes and strain ever known. You are overlooking a most fundamental and essential fact which is that no matter how much you produce and sell if your surplus or stock increases you have disastrous price changes due to the desire to get rid of stock. In February of that year the production was so great that if the addition to stock, continued throughout the year, the stocks would have amounted to 196,000,000 barrels. Fortunately it did not continue at that rate and in the latter half of the year production and consumption came into better relationship."

Mr. Roberts then tried another tack. He wanted to know whether the freight rate of 2 cents a gallon on gasoline from Tulsa to St. Louis when it was shown that gasoline sold at the refinery in Tulsa for a fraction over 11 cents was sold in St. Louis, at retail, for 19 cents, or at a profit, as Mr. Roberts suggested, of 6 cents a gallon for the business of transferring the gasoline from the tank car to the tank of the automobile.

Mr. Welch calmly suggested that a comparison of rates on gasoline alone, only one of the products of a barrel of crude, without comparing them with rates on the rest of the products, was of little value. Besides, he added the gross revenue obtained by the retailer, as Mr. Roberts suggested, might not have all gone to the retailer. Mr. Roberts' idea was to show that the compensation for the retailer was high in comparison with the compensation of the railroad.

Wage Rates Enter Case

But that was not the only large point brought out by the witnesses. Mr. Walker's testimony showed that the industry had done a large volume of business despite the high demands of the railroads, due, it was said, to the high wages demanded and received by the employes of railroads for work that, economically as shown by data in other industries, was of much less value that the rates exacted.

His testimony showed that in the first nine months of 1921, the railroads handled only 736,625 carloads of refined products as against 804,623 in the corresponding months of 1920, or 8.5 per cent less while consumption decreased only .02 per cent. In the matter of crude the railroads lost 26.2 per cent in comparison with 1920, while the crude run by the refineries increased 5 per cent.

In other words, if the industry increased its business in 1921 over 1920 the fact was not due to anything the railroads had done for it but despite what they had done to send the cost so high to the consumer that he cut down his consumption of railroad-borne products, although he increased his consumption of water and motor truck borne products.

Line Up of Business

Among Mr. Welch's multitude of figures were those showing that the exports of gasoline amounted to 12 per cent; the miscellaneous uses 8 per cent; tractors 10 per cent; trucks 30 per cent and passenger automobiles 40 per cent. However, that 40 per cent, he suggested was not for pleasure use because it was estimated that farmers owned 3,000,000 automobiles and that they certainly were not devoted exclusively to pleasure riding. His estimate was that not more than 15 per cent of gasoline consumption was caused by what could be strictly termed pleasure riding. The consumption by trucks was enormous, he said, although their comparatively slow movement might give a contrary impression. Many of his figures were taken from Dr. Joseph E. Pogue's book and were brought down to date.

Enormous losses, he said, were suffered in 1921 as might be inferred from the fact that the 1920 production of crude was valued at $1,200,000,000 while in 1921 it was valued at only $800,000,000. The marked declines took place in products other than gasoline, although the decline in that product was great enough to jar even railroad men, used as they were to dealing in large figures.

Comparisons of pre-war and post-war conditions in the oil industry, Mr. Welch said in answer to questions by Commissioner Esch, would be like comparisons between ancient and modern times. The war demand, he said, had revolutionized the industry.

"Personally I never expect to see oil back on the pre-war basis," said the witness." In 1914 there were about 2,500,000 automobiles. Now there are four times that number and the unit of cost in procuring oil for them is rising. Wells are being sunk deeper and that is raising the unit price. You may obtain more oil by drilling deeper and then you may not, but the increase in the cost takes place." He used Cushing for purposes of illustration and suggested that the like of that field would never again be seen. That made Commissioner Hall ask, a bit sarcastically, if the witness thought the earth's surface had been so thoroughly explored.

Cost of Production Greater

"Oh, no, I am not of the school that thinks oil will be exhausted in 18 or 20 years. The point I am trying to make is that I think the cost of obtaining it hereafter is going to be greater."

Mr. Moffit presented the results of a survey of the refining industry made in Oklahoma, Kansas and Texas. In those states, he said, there were about 250 refineries, of which number 130 were closed. He obtained answers from only 15 per cent with a daily refining capacity of 98,800 barrels. That 15 per cent, he said, was refining only 31,010 barrels of 31.4 per cent of capacity. Eleven letters had been returned to him unopened, indicating to him that the concerns had gone out of business. Of the 21 plants in operation from which he had obtained reports, he said, represented an investment of $45,415,350, or an average of $556 a barrel of refining capacity. Using that average he calculated the investment in the 250 refineries, none of which was owned by the larger units in the industry, to have been $320,228,200. His reports from the 15 per cent indicated an operating loss of 13.5 per cent and a loss from shrinkage through inability to do business of 30.7 per cent.

Immediately after the increase in rates in August, 1920, Mr. Moffit said, there was a big increase in the pipe line facilities on the part of the big units in the industry near the points of consumption, which certainly was not in the interest of the railroads, nor of the part of the industry dependent on railroads for its transportation.

Percentage Method Criticised

Turning to railroad rates on fuel oil and coal, he criticised the percentage method of increases. He said the result of the increase in August, 1920, was such that it was equivalent, on fuel oil, to a rate of $6.09 cents a ton of soft coal, for a haul from Tulsa to Pittsburgh in a car furnished by the shipper of oil. Commenting on such a policy on the part of the railroads, he said there was no traffic that is more easily handled than tank cars of fuel oil and none affording a more satisfactory revenue. He said the records of his company showed that a tank car, on an average, travelled 3,000,000 miles or enough to encircle the globe 133 times before going out of business.

In answer to a question by Commissioner Hall, he said he thought fuel oil should take a rate lower than crude because crude has more constituents of value in it than a car of fuel oil.

In behalf of the industry in California, W. B. Roberts asked for a 15 per cent reduction and then the removal of the 4.5 cents a 100 pounds specific imposed in the summer of 1918, as a substitute for the 25 per cent increase ordered by Director General McAdoo. He said that a reduction on fuel oil would be to industry west of the Rockies the same as a reduction in rates on coal in territory east of those mountains because in several of the far western states fuel oil is the same as coal to industry in the eastern states. He said that 25 per cent of the cost of operating farm tractors is represented by the cost of fuel and lubricating products. Therefore, a reduction in the freight rates on fuel oil and lubricating oil would be a direct benefit to the farmers.

Pointing to a concrete case in which the imposition of the 4.5 cents a 100 pounds specific was likely to cause the investment of new money he pointed to the company's station at Lakeview, Wash. For a haul to South Tacoma the railroads had added 4.5 cents. That addition to the transportation cost, he said was so heavy that unless the carriers made a decent rate the company would move its station to South Tacoma, although that would cost it $100,000. It would be cheaper, however, to avoid that excessive charge at that cost than to pay it.

The last two big general advances, W. H. Reed, traffic manager for the Union, speaking as a witness for the Institute, said, had the effect of localizing the industry and cutting down the neutral zones in which the various units could compete. The tendency of the rates was to restrict each company to a particular territory because they erected invisible barriers. He said he believed a reduction in rates would give the railroads much greater revenue. Business is now going by pipe lines to the coast and thence by water wherever possible, especially the Gulf coast. Proper rates, he said, would probably restore a good deal of that business to the railroads.

Some Pittsburgh steel plants, he said, when rates went up, turned from oil to coal because the cost of oil, due to the freight rates, became an impossible fuel. He submitted figures to show that the pipe line rates from the Mid-Continent to Gulf ports were only about half the rail rates and that the rates on fuel oil to New England were about double the rates on tidewater coal, although in hauling coal the carriers' are compelled to stand the cost of cars, while in hauling oil that expense is borne by the shipper.

Pennsylvania Refineries Hit

Colonel Lyons said the rates had driven his business, to a large extent, to western refiners and the tankers from Mexico and Gulf ports had driven the Pennsylvania refiners from the New England field, so that his business is largely local. While there had been a reduction of 12 per cent in exports, the exports from the Pennsylvania refineries fell off 65 per cent.

Mr. Porter said the high rates for short hauls was driving short haul business to motor trucks. He predicted still larger losses in traffic if the rates were not reformed.

In behalf of the whole industry's rate committee, Mr. Reed made the following specific rate adjustment recommendations:

Official classification territory, that is the eastern district, except New England, basis in effect Jan. 1, 1917.

New England, a flat reduction of 4.5 cents a 100 pounds between all points in New England.

Between trunk line and New England, reduction of 4.5 cents observing 90 per cent of fifth class as maxima.

From Central Freight Association territory to New England, 2 cents a 100 pounds over the New York rate made in accordance with the recommendation in the first paragraph.

Southern and Western classification territories, that is the South and West, 15 per cent reduction, plus 4.5 cents a 100 pounds and proportionals 15 per cent off, plus 2 or 2.5 cents a 100 pounds.

All territories: That the application of any minimum rate for short hauls be eliminated.

Approving what had been recommended by Mr. Reed of the Union Petroleum Co.,

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as to the methods to be used in making reductions in rates, A. C. Holmes, traffic manager for the Empire Refineries, Inc., at the Feb. 24 session, said the investment in the oil industry amounted to $6,000,000,0000 or nearly one third the investment of the railroads. Answering a question by Commissioner Hall, he said that was the estimate of Dr. Pogue which had been adopted by him. That valuation, he said included all the ramifications of the industry.

Commissioner Aitchison wanted to know if all the refineries were running whether the product could be sold. The witness said it could not at present. More fuel oil could be sold, he said, if the freight rates were made so as to allow it to compete with coal. Coal moving at lower rates, he said, was the only thing that was keeping down the sale of fuel oil.

The competition of coal, Commissioner Hall suggested, did not keep fuel oil from rising from 1 cent to 2 cents a gallon. The witness agreed with him but suggested that an increase in the price of fuel oil at the time when everybody was scrambling for fuel was not at all surprising.

Should Seek Oil Traffic

After approving what Mr. Reed had recommended, that is, a reduction of 15 per cent and a total elimination of the 4.5 cent specific, Mr. Holmes said it appeared to him the carriers should try to build up their oil traffic now by reducing rates, thereby getting the traffic back to the rail lines instead of allowing it to go by pipe lines and boats. A reduction in the long haul rates, in his opinion, would bring the business back to the rail lines.

A difference of 1 or 2 cents a gallon on gasoline, he said, kept the Mid-Continent refiners out of the long haul market. With the rate reduced so as to eliminate that difference which now operates against the Mid-Continent field, he said he believed the Mid-Continent refiners would be able to return to the markets from which they were driven by the percentage increases under Ex Parte 74. He had no doubt about the deleterious effects of that percentage increase, which in the case of General Order No. 28 was softened by commutation to a specific increase of 4.5 cents a 100 pounds to which the shippers on short hauls seriously objected and are still objecting.

Mr. Boltz called attention to what he termed the special hardships to which refiners in official classification territory had been subjected, to the enormous increases resulting from the Fifteen Per Cent Case, the application of the Disque Scale in Central Freight Association territory, General Order No. 28, and finally, Ex Parte No. 74. He put in a rate compilation intended to substantiate the claim made by Colonel Lyons, president of the Association in his testimony the day before.

Mr. Boltz said that the industry in Official Classification territory had long been of the opinion that rates on petroleum and its products were too high. That conviction, he said, had been set forth in a number of formal complaints seeking for relief from unreasonable rates. He estimated that since 1914 the eastern district refiners had been subjected to an increase of 110 per cent which is the percentage of increase applied to the most valuable merchandise since 1914.

Mr. Boltz said the 4.5 cent increase under Freight Rate Authority No. 96 was unscientific and unsound. Mr. Hall wanted to know if the National Petroleum Association had objected to it.

"Most emphatically we did," said the witness. "We did not approve that change. We made our position known to the Railroad Administration at the time the matter was under consideration."

The witness said he felt a general rate reduction was necessary if the industry in Official Classification territory was to survive. Referring to the recent 3 5 cent reduction on petroleum and its products in Central Freight Association territory, he said it was as unsound a thing to do as to make the 4.5 cent increase. To apply the wrong remedy to a patient seriously ill was not a good thing to do, he suggested. He said the correct thing to do would be to go back to the 1914 basis of rates and build up from that foundation rather than to make a reduction such as was made on Jan. 1.

Frankly, and in answer to questions by D. P. Connell, for the Central Freight Association lines, Mr. Boltz admitted such a method would result in rates but little higher than in 1915. He said some of the rates resulting from such a method would be somewhat lower than they were in 1917.

Clifford Thorne, for Mid-Continent refiners, while approving what had been done by the parts of the industry on the stand previous to his appearance, put on witnesses to show the special misery of the industry in that part of the country.

Make Own Showing

H. H. Smith, secretary of the Mid-Continent Oil and Gas Association, presented the general statistics and H. G. James, secretary of the Western Petroleum Refiners' Association, presented the views of its members. Two other witnesses also appeared for that part of the country. Mr. Thorne made it clear that his clients were not objecting to anything any other parts of the industry had suggested; that, as a matter of fact, they endorsed all the recommendations made by Mr. Reed and the slight variations proposed by W. B. Roberts. They desired, however, to make a showing in their own behalf.

While Mr. Smith was on the stand the railroad attorneys suggested the incorporation in the record of the refinery statistics for 1921 prepared by H. J. Lowe, petroleum economist of the Bureau of Mines, released the day before, which showed an increase in the production of gasoline in 1921 of 271,002,659 gallons over the production of 1920, or 195,692,221 over 1919, and that last year was the greatest year the industry had ever known.

The oil men were not averse to having the figures put into the record because they had frankly admitted the large production in 1921 and the ruinous reductions in price resulting from the over-production.

Mr. Smith submitted his exhibits without any explanation, the intention being merely to have figures to which the Commission could refer.

Refineries Are Idle

According to Mr. James 60 per cent of the refineries in the Mid-Continent field were idle at this time, with constant additions to the list of inoperative plants. He reviewed the progress of the industry from 1859 to the present time saying the passage of the maximum freight law in Kansas in 1905 marked the real beginning of progress by the Independent refiner. Existence of the Independent refiner, he said, depended upon equitable freight rates. Freight rates, he contended, constituted the dominating influence. The growth of the automobile industry had been a material factor in the development of the oil industry. When business picked up, he said, the Mid-Continent refiner should be permitted to live, the same as the railroads. Due to the high freight rates, he said, refineries had been built in sections formerly supplied by the Mid-Continent refiners, thus driving them from markets involving long hauls.

"The hope of the railroads lies in increased tonnage," said the witness, "and there is no hope of increased tonnage except through a reduction in freight rates."

In continuance of his recital to show the importance of the Mid-Continent part of the oil industry, Mr. James said the value of the corn and wheat crops in Kansas, Oklahoma and Texas, according to the latest available figures was $322,000,000; while the value of the crude oil in those states was $332,000,000.

Mid-Continent Shut Out

The high freight rates, Mr. James said, had completely shut Mid-Continent refiners out of many northern states, the differences in rates being from 13.5 to 27 cents a 100 pounds against the Mid-Continent units. Differences in rates of that size, he said, meant differences ranging from $80 to $175 a car from northern Texas to markets in Minnesota and the the Dakotas.

A. P. Winn, traffic manager for the Midland Refining Co. at El Dorado, Kans., and Burkburnett, Texas, said the oil industry was a good deal like the British Empire—a patched up affair with conflicts of interests and seeming contradictions. According to his view the Mid-Continent oil rate case, 36 I. C. C. 109, was the foundation for the rates that had enabled the Mid-Continent industry to develop and become an important factor in the world's supply of petroleum products. Ex Parte 74, he said, upset the group relationship and localized the business. The witness offered exhibits showing the price of oils, compiled from **National Petroleum News.** Commissioner Hall inquired as to whether that was recognized as an authority on prices. The witness said that that publication was recognized by the oil trade as being as much of an authority as the *Traffic World* is regarded in traffic matters and the *Railway Age* in railroad matters. He said that its prices and other statistics were considered as wholly reliable.

Shipments Cut Down

Speaking of the operations of the company with which he is connected, he said that under the rates prior to Ex Parte 74 in 1920 it shipped 822 carloads to points east of the Mississippi River while in the corresponding part of 1921 it was able to ship only 182 cars, although statistics showed that the production in 1921 was greater than in the preceding year. His company shipped more fuel oil in 1921 than in 1920, he said, but the distribution was confined to nearby points.

The increase in fuel oil in 1921 was 20,000,000 barrels. The commission wanted to know why that was, suggesting that perhaps fuel oil had replaced coal. The witness' opinion was that that was true to a certain extent but the largest factor in the stimulation of the shipments of fuel oil was the fact that oil rates were not increased in Kansas. He said there had been a great loss to the carriers by reason of oil moving through pipe lines.

Mr. Roberts, speaking for the St. Louis-San Francisco and other southwestern lines, told the witness into a mass of price

figures, being able to do so without violating the rules of cross-examination because Mr. Winn had quoted prices. Mr. Roberts suggested, and tried to have the witness agree with him, that inasmuch as gasoline was selling for a certain price in Chicago someone was getting a profit of 6 cents a gallon while the railroads were obtaining only 2.6 cents for moving it from Tulsa to Chicago.

"Isn't it a fact that the freight rate has nothing whatever to do with the retail price as there is only 1 cent difference between the Chicago and Tulsa retail prices?" The witness did not make a definite answer. Mr. Roberts cited a lot of retail prices in cities in the east and the freight rates from various refining points to those cities to show, as he claimed, that freight rates have nothing to do with the price of gasoline.

A. T. Sindel, of Chicago, the rate expert of the Western Petroleum Refiners Association, filed rate compilations to show, in figures, why the Mid-Continent refiners are unable to get much farther in the distribution of their products than their front door steps. One effect of the restrictions upon their operations, he said, was the rendering idle of 46.5 per cent of the cars owned by Mid-Continent refiners while the idleness of other kinds of cars is only 18.5 per cent. He was not satisfied with the exhibit of rates and idle cars, but presented tonnage figures for the last four years.

Moore Discusses Rates

J. K. Moore, accountant and rate expert for the Corporation Commission of Oklahoma, although not called as an oil witness, discussed oil rates to a considerable extent after saying whatever reductions the commission might find could be made should be applied to basic commodities rather than in the form of a horizontal reduction on all commodities. Next to agricultural products and coal, the witness said, oil was the most important basic commodity entering into the life of the people of Oklahoma.

Commissioner Lewis asked Mr. Moore if he intended to place coal ahead of oil in importance. Mr. Moore said that when he mentioned coal as being ahead of oil he had in mind the whole country and not merely Oklahoma. To Oklahoma, he said, oil was more important than coal. Oil came into active competition with coal as fuel, he said, on the railroads and industries as well. It was his opinion that the commission should maintain a reasonable relationship between the rates on coal and fuel oil. Ex Parte 74, he said, forced Oklahoma refineries to retire from markets more than 500 miles from the points of origin.

Save Dying Industry

"Permit me, please," said Mr. Moore, "On behalf of the Oklahoma commission, most respectfully and earnestly to urge this commission as early as possible to prescribe in lieu of the present unreasonable rates on petroleum and its products applying from Oklahoma, reasonable through rates to all points of destination, and save a dying industry."

H. W. Klingesmith, of Pittsburgh, traffic manager of the Transcontinental Oil Co., filed a map showing the restriction of the territory of distribution for that company which, he said, in 1921 had only 50 per cent of the tonnage in 1920. He ascribed the reduction entirely to the increases made under Ex Parte 74.

The first American conference on Foreign Oil Possibilities was held, Feb. 21 and 22, under the auspices of the American Institute of Mining and Metallurgical Engineers, in New York. A number of valuable papers were read at the conference by foremost American geologists.

That these papers might be made immediately available to the oil industry, National Petroleum News was given permission to abridge them for publication. They will be published in full in Mining and Metallurgy, or in Economic Geology, at a time not yet designated. Full credit is given to the Institute by this paper for the exclusive early publication of these reports.

Wherever possible, the authors of the papers were consulted that editing might be systematic and that no parts essential to the importance of the subjects should be abridged. Acknowledgement is made to Dr. Ralph Arnold, chairman of the petroleum and gas committee of the Institute, who supervised the work of revising and editing. The report of the convention is found on page 25 and the papers beginning on page 48-A.—Editor.

Gulf To Loop Its Main Line Through Oklahoma

Staff Special

TULSA, Feb. 28.—In order to care for the constantly increasing production of the Gypsy Oil Co. and other companies from whom they purchase crude, the Gulf Pipe Line Co. will immediately loop their 8-inch main line through Oklahoma, increasing the capacity of the line about 8,000 barrels a day and enabling them to handle about 30,000 barrels daily. The company will add one pumping unit to each main line station using 150 horse power Delavergne engines. It is also erecting additional tankage at each of its pumping stations. Two tanks are being constructed at Burbank from which field the company is running about 12,000 barrels daily. The main line of this company which is eight inches, formerly was looped with a 6-inch line, but this was taken up several years ago when it became unnecessary for handling the oil. The loops now being constructed will be of 8-inch pipe. Additional right of way has been secured for the new lines and the pipe has been ordered. What provision for handling the increase in daily deliveries through the company's line in Texas has not been announced as yet but the capacity there will have to be similarly increased. This is taken as an indication that the big companies want all the light Oklahoma crude they can get even if special arrangements are necessary in order to handle it.

PITTSBURGH, Feb. 22.—E. D. Mason is leaving the Transcontinental Oil Co. and will resume his practice as sales and advertising counsel at 233 Oliver avenue, Pittsburgh.

It's a good idea to read the classified advertising carried under the heading "Oil Industry Exchange," near the back cover of this or any other issue of National Petroleum News.

Prepares Report On Haynesville Field

By Special Correspondent

WASHINGTON, Feb. 25—A report on the Haynesville oil field, Claiborne parish, La., by W. W. Scott, petroleum engineer, United States Bureau of Mines, and Ben. K. Stroud, Supervisor of Minerals of the State of Louisiana, has been published by the Department of Conservation of the State of Louisiana.

The Haynesville field is at present the most important area in northern Louisiana from the viewpoint of drilling activity and production of oil. The first well was completed March 30, 1921, and on Dec. 31, 1921 approximately 3,550,000 barrels of oil had been produced. From present information there are about 5500 acres within the proved limits of the field with only about 20 per cent of this area drilled up.

The report considers drilling methods, water conditions, production and recommendations for further development. A map of the field with the report shows the location and status of the wells as of Dec. 31, 1921, the known limits of the field as of that date, the location of edge water with respect to structure, the encroachment of edge water during Dec. 1921, the status of the individual wells with regard to the production of oil and water and the source of water. Under ground contours have been drawn to represent the depth of the pay sand (Blossom sand) below sea level.

A cross section running north and south through the middle of the field also shows some interesting features such as the relative depth of the Nacatoch, Blossom and Woodbine formations, all of which are known to have produced oil and gas in northern Louisiana. It also illustrates the term "edge water" and "water in the base of the sand."

Copies of Bulletin No. 11, "The Haynesville Oil Field," may be obtained without cost by applying to the Department of Conservation, Ward Bldg., Shreveport, La.

To Discuss Handling Of Natural Gasoline

Staff Special

TULSA, Feb. 25.—A paper on "The Use and Handling of Natural Gasoline in Refining Operations" will be read at the annual convention of the Western Petroleum Refiners Association to be held at New Orleans on March 8 and 9, by some representatives of the Association of Natural Gasoline Manufacturers. The person to read the paper is to be chosen at the next meeting of the executive committee of the latter organization.

The paper is to be prepared in three sections bearing on the subject. L. F. Bayer of the Tidal Refining Co., will prepare a section on the compression process. G. G. Oberfell of the Chestnut and Smith Corp., will write the section relating to absorption, D. E. Buchannan, sales manager of the same company, will write on natural gasoline as related to refining.

Following presentation of the paper the gasoline manufacturers will print it in pamphlet form and distribute it to jobbers and refiners throughout the country.

Gasoline Production Grows 5. 5 Per Cent; Consumption Up 6. 3 Per Cent

By Special Correspondent

WASHINGTON, Feb. 27

PRODUCTION of gasoline by United States refineries in 1921 exceeded that of any other year in the history of the oil industry and likewise the domestic consumption of this product was greater by 271,002,669 gallons or 6.3 per cent than the consumption in 1920, the previous record year. The year's output was 5,153,-549,318, gallons, an increase of 5.55 per cent over 1920, according to refinery statistics for 1921 compiled by H. J. Lowe, petroleum economist of the Bureau of Mines.

At the end of May more than 800,000,000 gallons of gasoline were held in storage. This was the largest amount on record but from then on until the end of October there was a steady decline in stocks. The amount of stored gasoline increased from 456,269,659 gal, lons on Oct. 31 to 495,590,059 on Nov. 30 and to 586,087,132 at the end of the year. This amount was a little more than 10 per cent of the output of refineries during the year. Storage at the end of 1920 was 462.381,837 gallons or 123,705,000 less than at the close of 1921.

Consumption Grows

During 1921 consumption of gasoline amounted to 4,516,012,979 gallons, which was approximately 260,000,000 gallons more than in 1920 and 1,081,000,000 more than in 1919. The daily average consumption of gasoline during the year was 12,-372,638 gallons as against 11,651,422 in 1920. Exports shrank 110,968,456 gallons from 635,247,487 in 1920 to 524,-279,031 in 1920, but were almost 158,400,-000 gallons more than in 1919.

The daily average of gasoline production in 1921 was 14,119,313 gallons as compared with 13,340,291 in 1920 and 1,084,344 in 1919—a gain of 742,473 gallons a day over 1920 and 3,275,869 a day over 1919.

More gasoline was turned out by the refineries in January than in any other month of 1921, the toal being 460,432,-439 gallons. May was the next highest producing month when 448,567,873 gallons was turned out. Atlantic coast refineries led in gasoline production with 1,020,002,543 gallons for the year. Those of Texas ranked second with 976,229,091 gallons, and Oklahoma and Kansas third with 958,544,972 gallons output.

WASHINGTON, Feb. 27.—According to refinery statistics of the Bureau of Mines for 1921, on Dec. 31 there was gasoline on hand to run the United States only 47.3 days at the average rate of consumption for 1921 which was 12,372,638 gallons a day. Figuring on the same basis, the kerosene supply was sufficient to meet the demands of 103.3 days at an average consumption of 3,398,769 gallons a day; gas and fuel oils, 68 days at 19,398,000 gallons a day, and lubricating oils 149 days at the rate of 1,452,803 gallons a day.

The monthly consumption of gasoline was as follows:

	Gallons
January	294,750,791
February	225,195,372
March	346,164,546
April	333,290,821
May	354,263,486
June	445,024,973
July	457,758,078
August	503,513,463
September	438,083,634
October	454,991,538
November	350,548,481
December	313,001,319
Total, 1921	**4,516,012,979**
Daily average	**12,372,638**

The output of kerosene for the year was 1,945,126,156 gallons, compared with 2,320,095,443 in 1920 and 2,341,632,164 in 1919. The daily average kerosene production was 5,329,113 gallons as compared with 6,339,059 in 1920 and 6,415,430 in 1919.

The domestic consumption last year was 1,240,550,811 gallons, which was less than in any of the preceding three years. The average daily consumption of kerosene was 3,398,769 gallons or about 421,000 gallons less a day than in 1920. Exports, likewise, showed a steady decrease in the last three years, being 965,415,225 gallons in 1919, 848,212,146 in 1920 and 740,152,-850 in 1921.

Kerosene exports for the year were 740,-152,850 gallons as compared with 848,212-146 in 1920 and 965,415,225 in 1919

Stocks on hand at the refineries on Dec. 31 were 341,008,555 gallons as against 393,070,923 on Dec. 31, 1920 and 339,319,-690 at the end of 1919.

Texas ranged first in kerosene production with Atlantic coast refineries second and Kansas and Oklahoma third.

Gas and Fuel Oil

Gas and fuel oil output was greater than any of he preceding years and the stocks on hand at the end of the year were 493,-861,025 gallons more than on Dec. 31, 1920. The year's output was 9,663,816,135 gallons as against 8 861,451,931 in 1920 and 7,627,288,556 in 1919.

Domestic consumption, however, was greater than any previous year, being 7,080,351,916 gallons or a daily everage of 19,398,000 gallons as compared with 18,320,000 in 1920 and 17,234,000 in 1919. Exports, including bunker oil for ships engaged in foreign trade, totaled 1,964,-461,658 gallons, in 1921, 1,933,659,336 in 1920 and 1,174,166,557 in 1919.

Stocks on hand Dec. 31 totaled 1,331,-265,439 gallons. At the end of 1920 the total was 837,404,414 and 1919, 714,124,-455. The 1921 increase over 1920 was 493,861,025 gallons.

Lubricating Oils

The output of lubricating oils amounted to 877,859,074 gallons, a decrease of 168,-849,275 from the 1920 production but 3,099,-057 gallons more than 1919. The consumption was 530,273,196 gallons. In 1920 it was 609,750,289 and in 1919 568,382,979.

(Continued on page 23)

Stocks on Hand at Refineries at Close of Each Month

1919	Crude Oil Bbls.	Re-run Bbls.	Gasoline Gals.	Kerosene Gals.	Gas & Fuel Gals.	Lubricating Gals.	Wax Pounds	Coke Tons	Asphaltum Tons	Misc. Gals.
November 30	13,983,716	1,113,581	378,133,185	347,070,560	791,052,991	149,193,143	239,710,946	31,933	82,304	435,315,076
December 31	13,143,285	1,141,584	446,793,431	339,319,690	714,124,455	137,318,934	212,461,594	21,146	73,449	401,883,474
1920										
January 31	13,200,727	966,503	515,934,364	327,548,646	652,080,901	141,690,177	203,662,032	21,236	72,036	391,033,357
February 29	13,500,599	863,220	562,996,489	330,120,942	590,322,125	132,759,244	197,996,501	21,709	70,067	405,588,469
March 31	14,346,458	806,479	626,393,046	334,617,117	580,182,858	130,630,597	168,030,018	17,542	87,720	428,749,660
April 30	15,145,691	758,938	643,552,644	376,358,123	590,687,009	140,355,972	188,170,912	19,694	78,273	487,932,157
May 31	15,331,375	839,071	577,671,759	419,077,605	618,939,135	135,882,485	177,847,274	18,836	71,273	488,168,962
June 30	16,172,280	1,029,066	504,055,601	421,343,353	641,968,363	133,212,551	169,508,631	19,340	51,478	481,974,195
July 31	17,086,253	900,544	413,279,319	410,853,047	655,152,293	131,866,455	171,666,198	21,058	71,368	505,098,890
August 31	17,960,558	1,019,123	323 239,991	378,548,791	708,608,472	130,797,810	161,843,186	27,094	68,209	498,513,894
September 30	18,830,079	1,067,019	288,195,394	379,300,705	771,126,965	130,449,829	158,743,995	23,522	74,944	530,965,968
October 30	19,237,730	1,138,956	301,283,731	383,828 239	799,024,084	136,194,914	170,424,853	24,899	79,217	529,163,468
November 30	21,373,945	1,021,017	354,835,764	398,991,592	808,802,516	142,180,775	179,706,317	25,405	80,369	564,361,719
December 31	21,260,580	1,118,659	462,381,837	393,070,923	837,404,414	160,522,477	195,367,552	31,469	81,097	580,465,205
1921										
January 31	21,064,124	1,290,738	571,983,793	418,747,781	921,028,127	183,813,205	217,983,072	36,018	94,886	626,916,173
February 28	22,411,819	1,420,415	680,540,351	430,045,193	993,127,328	201,627,558	234,456,284	44,758	115,092	665,496,129
March 31	21,147,257	1,538,193	713,043,480	446,367,188	1,005,317,939	223,414,093	341,497,529	55,895	129,391	675,921,481
April 30	21,054,630	1,361,776	747,222,900	458,666,896	1,056,484,544	249,593,330	256,254,892	62,446	141,318	726,818,013
May 31	20,816,203	1,117,042	800,495,787	452,437,995	1,163,388,695	261,759,797	266,233,119	70,383	135,172	714,188,830
June 30	21,008,986	800,561	750,644,450	435,056,713	1,248,664,088	260,883,121	261,328,486	66,710	132,604	748,787,601
July 31	19,115,631	866,264	684,239,695	412,201,674	1,269,419,283	258,638,298	260,891,035	70,396	129,686	721,940,469
August 31	16,374,050	878,099	567,645,548	389,893,421	1,243,445,980	242,530,099	244,111,173	67,981	89,739	696 701,755
September 30	17 991 036	839,421	515,325 998	371 235 034	1,229,254,127	230 227,413	237 421 155	67,758	90 968	691 915,316
October 31	18 404 182	1,134 886	456 269,659	334 579 774	1,238,269,365	216,770,320	223,013,334	64,413	87,262	662,272,028
November 30	21 856 185	873 324	495,590,059	340,026,007	1,279,450,548	228,037,890	216,5 5,861	59,076	120,275	679,654,792
December 31	26,562,424	989,470	586,087,132	341,0 8,555	1,331,265,439	216,765,516	202,562,894	74,508	98,330	525,909,094

Output of Refineries by Districts for August-December, 1921, Compiled by the United States Bureau of Mines

PERIOD	East Coast (N. Y. Phila. and Balto.)	Pa.. N. Y. E Ohio and W. Va.	W. Ohio, Ind.. Ill., Ky. and Tenn.	Oklahoma and Kansas	Texas Louisiana and Arkansas	Colorado and Wyoming	California	Total
CRUDE RUN (bbl.)								
August 1921	6,178,274	1,654,636	3,066,660	5,338,319	11,150,316	1,505,148	7,151,557	36,044,910
September, 1921	6,484,468	1,612,426	3,105,124	5,305,370	10,850,510	1,290,489	6,965,546	35,613,933
October, 1921	8,817,185	1,588,999	3,566,843	5,499,967	10,856,521	1,256,234	6,382,747	37,968,496
November, 1921	8,682,929	1,578,371	3,429,092	5,252,517	10,230,881	1,304,725	6,733,019	37,211,534
December, 1921	9,637,275	1,567,730	3,312,822	5,174,360	10,881,878	1,598,834	7,049,976	39,222,875
1921 *Total*	96,846,025	19,289,120	38,338,157	63,387,391	123,346,567	16,405,965	85,749,432	443,362,657
1920 *Total*	93,636,242	21,426,469	41,527,815	69,944,486	114,483,140	16,161,397	76,745,480	433,915,029
RE-RUN bbl.)								
August, 1921	605,937	83,016	307,589	323,726	395,336	727,096	262,420	2,705,120
September, 1921	976,806	203,059	182,613	202,610	928,605	647,376	586,288	3,727,351
November, 1921	709,837	99,418	93,014	223,258	715,322	824,477	291,143	2,956,469
December, 1921	586,617	102,605	125,844	275,274	734,342	1,156,877	608,657	3,390,216
1921 *Total*	9,644,889	1,608,179	4,003,771	2,766,988	6,245,710	7,672,347	4,550,681	36,492,565
1920 *Total*	6,648,192	2,038,341	5,938,883	2,695,235	9,529,043	7,675,818	5,709,079	40,234,591
GASOLINE (gals.)								
August, 1921	68,760,039	21,359,838	60,253,882	83,123,476	117,101,567	35,599,184	45,379,209	431,577,195
September, 1921	60,772,003	22,086,770	60,018,932	77,710,474	117,560,475	37,674,380	41,089,966	416,913,000
October, 1921	82,457,009	21,375,475	65,018,576	80,700,849	121,411,706	33,014,023	36,977,879	440,955,518
November, 1921	89,950,897	20,601,391	64,457,424	80,678,927	106,241,989	33,648,407	36,307,810	431,886,845
December, 1921	97,501,919	22,107,262	63,994,635	81,798,511	104,180,498	31,302,950	38,150,723	439,031,398
1921 *Total*	1,020,002,543	263,892,195	729,293,534	958,544,972	1,298,402,767	359,978,525	515,236,181	5,153,549,318
1920 *Total*	971,433,338	288,221,156	702,526,895	978,540,335	1,144,227,394	301,171,622	496,425,909	4,882,546,649
KEROSENE (gals.)								
August, 1921	29,836,489	13,211,167	11,429,095	23,811,119	51,722,353	7,308,726	6,333,341	143,652,290
September, 1921	28,666,409	14,035,273	10,725,954	27,047,435	52,034,136	9,753,464	11,754,628	154,017,299
October, 1921	46,277,977	13,103,741	13,639,482	27,558,400	58,577,166	7,790,000	15,506,832	182,453,598
November, 1921	49,267,420	11,700,556	12,072,491	25,890,518	55,930,760	7,124,267	13,254,454	175,240,466
December, 1921	41,964,238	10,896,381	16,327,380	26,340,422	58,333,095	8,171,026	13,282,737	170,315,279
1921 *Total*	451,191,068	154,452,256	168,145,862	303,565,342	632,156,105	73,620,174	161,995,349	1,945,126,156
1920 *Total*	496,693,032	173,335,530	217,379,237	394,064,175	714,198,204	116,962,578	207,462,688	2,320,095,443
FUEL, GAS OIL (gals.)								
August, 1921	128,061,351	15,287,577	40,673,874	108,280,837	248,646,171	80,547,568	212,953,107	784,450,485
September, 1921	144,440,717	16,263,202	36,547,660	105,265,087	244,053,507	26,715,726	215,122,225	788,408,124
October, 1921	199,875,814	16,585,608	47,514,076	105,092,451	250,511,555	20,540,887	193,654,803	833,775,254
November, 1921	182,433,791	15,592,936	36,888,968	97,403,408	239,661,993	28,305,275	198,970,236	799,256,607
December, 1921	216,950,447	15,382,587	32,988,888	97,169,665	265,556,541	30,448,726	207,272,224	865,769,078
1921 *Total*	2,202,236,304	189,749,604	445,753,465	1,197,674,182	2,790,356,545	305,229,050	2,532,816,985	9,663,816,135
1920 *Total*	1,941,536,216	207,604,376	563,608,370	1,337,766,609	2,392,032,950	212,948,859	2,205,955,551	8,861,451,931
LUBRICANTS (gals.)								
August, 1921	14,444,280	12,157,915	6,423,672	5,427,701	21,595,300	1,124,070	5,300,535	66,473,473
September 1921	18,995,483	12,495,375	6,188,270	3,839,568	19,568,019	1,464,098	6,502,554	69,053,367
October, 1921	24,521,384	13,165,889	7,363,987	4,747,282	19,717,006	891,990	5,563,839	75,971,377
November, 1921	25,615,468	12,796,279	7,514,785	4,926,303	19,212,290	710,625	6,229,292	77,005,042
December, 1921	30,029,529	11,791,858	6,171,962	5,469,151	21,827,422	992,821	6,289,919	82,572,662
1921 *Total*	263,023,940	148,524,983	94,285,121	62,815,828	216,101,828	13,609,980	79,497,394	877,859,074
1920 *Total*	329,404,503	189,982,314	126,338,535	91,228,610	202,884,344	14,578,336	92,021,707	1,046,708,349
WAX (lb.)								
August, 1921	7,940,867	5,660,211	2,803,819	2,175,223	8,642,934	1,228,902	46,452	28,498,408
September, 1921	8,701,343	5,600,859	2,890,533	1,663,650	10,229,394	5,880,001	88,387	33,054,167
October, 1921	12,895,683	6,172,547	2,707,023	1,343,168	11,657,082	3,402,100	87,175	38,264,768
November, 1921	15,305,406	7,472,094	3,293,522	1,801,529	11,287,034	2,414,668	.....	41,574,253
December, 1921	16,991,178	7,196,573	2,553,650	1,245,457	12,222,751	2,860,690	88,810	43,159,109
1921 *Total*	155,403,342	77,051,319	42,700,682	33,095,073	93,351,312	31,717,826	1,167,560	433,887,21
1920 *Total*	206,930,162	89,030,257	92,883,525	46,504,357	79,315,618	23,882,709	2,857,909	541,404,537
COKE (TON)								
August, 1921	10,601	1,635	14,845	2,049	10,840	2,632	.....	42,602
September, 1921	11,547	1,952	14,439	830	13,032	3,063	.....	44,863
October, 1921	14,618	1,528	15,422	2,135	15,188	3,477	.....	52,368
November, 1921	17,550	1,857	15,897	3,414	12,379	3,241	.....	54,338
December, 1921	29,943	2,039	13,659	2,006	5,770	10,072	.....	87,732
1921 *Total*	202,945	19,272	172,564	33,732	152,885	23,067	.....	604,465
1921 *Total*	204,968	18,363	170,832	41,252	130,268	10,930	.....	576,613
ASPHALT (TON)								
August, 1921	57,509	1,190	5,970	.....	28,300	.....	19,974	112,943
September, 1921	47,647	854	3,787	.....	35,224	.....	19,908	107,420
October, 1921	88,258	1,290	4,023	.....	43,499	.....	21,048	158,118
November, 1921	52,904	1,211	6,315	.....	28,925	.....	15,179	103,854
December, 1921	33,219	764	8,464	.....	32,304	.....	12,990	87,732
1921 *Total*	593,423	10,202	79,809	98	214,344	.....	216,658	1,214,536
1920 *Total*	539,805	5,548	110,082	.....	378,786	.....	256,393	1,290,614
MISC. (GAL.)								
August, 1921	10,925,530	5,399,962	9,300,713	8,192,343	15,958,183	11,492,851	31,194,120	92,463,702
September, 1921	13,569,954	1,949,306	12,109,282	7,282,014	12,944,904	5,520,074	29,675,041	83,050,575
October, 1921	14,536,946	1,971,910	9,405,272	10,734,202	14,245,247	11,456,481	31,306,910	93,656,968
November, 1921	8,361,186	3,629,246	12,537,121	10,273,384	8,451,896	12,216,775	31,055,108	86,524,716
December, 1921	6,605,606	3,990,610	10,273,156	9,253,713	9,825,497	41,943,164	48,184,327	130,075,973
1921 *Total*	120,583,146	47,230,799	168,662,800	131,495,504	172,585,417	176,699,713	385,175,784	1,202,433,163
1920 *Total*	79,259,297	48,763,341	197,586,951	111,502,582	431,451,989	300,725,257	323,294,109	1,492,583,526
LOSS (BBLS.)								
August	379,617	95,061	200,954	194,681	449,901	160,611	115,308	1,596,083
September, 1921	397,083	103,287	216,327	196,536	452,800	162,921	109,595	1,638,549
October, 1921	454,391	161,012	220,373	259,978	456,380	113,605	131,042	1,796,781
November, 1921	493,210	102,523	209,829	171,368	462,069	146,170	136,883	1,722,052
December, 1921	476,633	105,924	210,270	187,370	408,706	159,628	146,267	1,694,798
1921 *Total*	5,023,951	1,275,694	2,485,779	2,574,770	4,989,179	1,689,742	1,518,402	19,557,517
1920 *Total*	4,620,581	1,382,429	2,427,435	2,774,214	4,572,180	1,126,852	1,839,248	18,742,939

1921 Refinery Statistics

(Continued from page 21)

Exports were 287,204,684 gallons in 1921 and 408,920,890 in 1920, reflecting the depressed condition of European industries. Stocks on hand on Dec. 31 were 216,765,516 gallons as against 160,522,477 in 1920 and 137,318,934 in 1919.

The output of wax was 433,887,214 pounds, a decrease from 1920 and 1919 when 541,404,537 and 467,235,223 pounds were put out. Stocks on hand Dec. 31, 1921, were 202,562,894 pounds as compared with 195,367,552 on Dec 31, 1920. Production of wax increased 1,584,856 pounds in December over November.

Miscellaneous products produced in 1921 totaled 1,202,433,163 gallons, a decrease of 290,150,363 gallons from the 1920 production. These products were divided as follows: binder, 18,527,055 gallons; flux, 27,353,495; medicinal oils, 761,008; paint products, 226,220; petrolatum, 7,250,636; road oil, 125,820,652; roofers' wax, 66,166; sludge products, 34,672,612; acid oil, 2,271,513; distillates, 627,570,679; pitch, 129,800; residue, 5,786; slops, 757,125; tailings, 180,624; tar, 3,374,166; tops, 122,267,027; unfinished, 227,446,245; wash out, 25,280, and wax tailings, 3,687,074.

Runs of Crude

Crude oil runs to stills in 1921 totaled 443,362,657 barrels and other oils run aggregated 36,492,565 barrels. The domestic production of crude in 1920, according to the Geological Survey, was 469,639,000 barrels, and imports were 125,307,000 barrels.

In 1920 433,915,029 barrels of crude were run to the stills and 361,520,153 in 1919. Other oils run to the stills in 1920 totaled 40,234,591 and in 1919 45,762,616 barrels.

Listed among "the other oils" were 2,516,582 barrels of natural gasoline. This quantity of natural gasoline represents only a fraction of the natural gasoline that was marketed during the year. Hundreds of jobbers buy this product and blend it with heavier gasolines themselves. However, it has been found that a much better product is obtained when the natural gasoline is blended at the refinery.

American refineries during the year ran 75,325,670 barrels of Mexican crude oil, 2,745,015 barrels of Mexican tops and 160,557 barrels of Mexican crude naptha. The 1921 Mexican crude run exceeded that of 1920 by 19 per cent.

On Jan. 1, 1922, there were 303 refineries operating in the United states with a total daily capacity of 1,736,725 barrels. On Jan. 1, 1921, there were 328 operating refineries with a daily capacity of 1,714,395 barrels. These plants, according to the Bureau of Mines, were operating on a basis of 80 per cent of their capacity as compared with 84 per cent on Jan. 1, 1921. No account is taken of the many inoperative refineries.

Domestic Consumption of Leading Products
(Gallons)

	1921	1920	1919	1918
Gasoline	4,516,012,979	4,256,427,955	3,434,810,726	3,129,509,872
Kerosene	1,240,550,811	1,398,223,970	1,396,742,639	1,446,547,683
Gas and Fuel	7,080,351,916	6,704,769,734	6,290,368,081	5,719,223,476
Lubricating	530,273,196	609,750,289	568,372,979	580,552,186

Domestic Production of Leading Products

	1921	1920	1919	1918
Gasoline	5,153,549,318	4,882,546,649	3,957,857,097	3,570,312,963
Kerosene	1,945,126,156	2,320,095,443	2,341,632,164	1,825,360,137
Gas and Fuel	9,663,816,135	8,861,451,931	7,627,288,566	7,321,397,557
Lubricating	877,859,074	1,046,708,349	846,760,057	841,465,767

Court Attempts To Speed Up End Of Testimony In McDowell Trial

By Special Correspondent

TOLEDO, Feb. 25.—The McDowell trial has arrived at the "beginning of the end." It is believed by all concerned that the case will go to the jury before next Saturday. Several things have happened in the last few days to warrant this prediction.

Judge John M. Killits, in cutting short the usual week-end recess, which used to begin Friday afternoon and end Tuesday noon, announced he expected to bring the trial to a speedy end by having the jurors work Saturday morning and Monday afternoon. The fact that the attorneys on both sides are decidedly more on the "qui vive," that objections are more frequent and that the Court issued a sort of warning against too much fraternizing in the court room on the part of jurors, attorneys and litigants during recesses is looked upon as one of the indications of an early termination of the case, in which rebuttal testimony has already been offered.

The larger part of last week was taken up with the cross-examination of Jesse C. McDowell, defendant, against whom the government of the United States is prosecuting the charge of using the mails to defraud Henry L. Doherty & Co. and the Cities Service Co. He went on the witness stand in his own behalf and by doing so, he threw himself open to the widest range of cross-examination, according to repeated rulings by Judge Killits, who almost invariably overruled objections by counsel for the defense to questions by Prosecutor John S. Pratt.

"Neither the court nor the government is concerned as to how much damage developments in this case may cause the defendant in civil suits which may be pending against him or which he has pending against others," Judge Killits said on one occasion, when an objection was based on the assertion that the question asked by the prosecutor had "nothing to do with the case on trial and was propounded only for the purpose of gathering evidence against McDowell in other suits which are pending."

A rather sharp set-to between opposing counsel enlivened an otherwise dull day last Friday. When it developed that the prosecution was prepared to have typewriter experts testify relative to a letter which McDowell claims he wrote Henry L. Doherty regarding a commission he expected to get on the purchase of the Berea Pipe Line Co., Attorney E. L. Humes, chief counsel for McDowell announced the defense was ready to "make an admission" in order to save time.

"The government does not want any admission," Prosecutor Pratt said. "The defense has brought this letter into the case as its chief element of defense on one of these transactions, the government, never having seen this exhibit before the time it was introduced, is prepared by handwriting or typewriting experts to show that this letter is fraudulent and a forgery. Now is it possible at this time when the government discovers that this is a fraud, that defense counsel are going to come here and say 'well, possibly, this is not what we represented it to be'?"

Attorney McMahon: "We except to Mr. Pratt's statement and assign his remarks as misconduct."

The Court: "Objection is overruled."

Attorney Humes then renewed his "offer of admission," saying the defense was prepared to admit that the typewritten carbon copy is a copy of a letter transcribed on the typewriter in Mr. McDowell's office sometime in 1920 or 1921. (The letter bears the date of July 7, 1917.)

The Prosecutor: "If the court please, that is absolutely an imposition upon this court to even make that suggestion."

The Court: "I am going to agree with you. I think this jury has the right to have all the light it can possibly have upon this important document, and in view of the character of the cross-examination as to the status of this document it seems to me the government ought not to be inconvenienced and hampered by any admission of that character."

Further efforts toward having the admission accepted having failed it was withdrawn entirely, whereupon the court instructed the jury not to regard any statement by the defense counsel as to the character of the document in in question.

Defense Asks for Ruling

This led Attorney McMahon, for the defense, to ask the court to also instruct the jury to disregard exhibits which had been placed in the court room during recess and which were composed of greatly enlarged photographs of various letters including the one in question, all of which originated in the office of the defendant. Referring to the exhibits McMahon said: "These exhibits were brought into this court room fifteen minutes or more before court convened and have been subject to examination by the jurors and subject to exposition at least, not directly, by counsel in explaining to outside persons."

To this Prosecutor Pratt replied: "I resent that personally as being a reflection upon by personal conduct." McMahon said Pratt probably overlooked the fact that some of the jurors were close enough to hear him. "I made no explanation in anybody's hearing, certainly not in the hearing of any juror," replied Pratt.

Judge Killits then took occasion to deplore the lack of convenient quarters for federal juries here. "We are constantly submitted to inconvenience because the government furnishes no comforts for the jury whatever. The

jury is forced to come into social contact with counsel and litigants, and into contact in a similar way, with the preparation for presentation of cases. It is not the jury's fault, but that is unfortunately the case.

"The theory of a jury trial is that the jury is a selected body of men carefully segregated, carefully kept away from any possible contact with any sort of influence, whatever it may be, social intercourse, exhibition of friendly interest on the part of litigants and their counsel, or contact in any way when not in the box with anything that may possibly bear upon the case.

"The situation in this case has been such that outside counsel, coming here from other courthouses, have commented on the loose way in which this trial has been conducted in this respect, not knowing of the embarrassments to which the court and the jury are subjected.

"The things that have happened in this case since we began early in January will call upon the court to give this jury some specific instruction regarding its peculiar functions, and how the jury should exercise these functions."

It is expected that the court will include reference to this matter in the final instructions to the jury, which it has been indicated on various occasions, will be quite lengthy.

The Defendant's Letter

The letter, a carbon copy of which was introduced by the defense and which McDowell testified he mailed to Doherty in July, 1917, follows:

"Dear Mr. Doherty: On the purchase of the stock of the Berea Pipe Line Co. recently agreed to between Mr. L. G. Neely and Henry L. Doherty & Co., I am to receive from Mr. Neely 500 shares of Cities Service Co.'s preferred stock as a commission on said sale when the said stocks are exchanged. If this is not satisfactory please have the value of the stock charged to my account, the amount to be deducted from the percentage of the earnings of Henry L. Doherty & Co. accruing to me by the terms of my agreement with you.

Very truly yours,
J. C. McDowell."

McDowell says he sent the letter at the time the date indicates. His private secretary, Miss B. G. Melus, testified she wrote letter at that time and it was mailed as all other letters were mailed. But Doherty testified he never received it, although he admitted that he did not receive all mail addressed to him. He added, however, he was sure a letter of such importance as that would have been called to his attention.

The government, in an effort to prove that the letter was not written or mailed on the date it bears, had Albert S. Osborn, handwriting and typewriting expert, of New York on the stand, Friday afternoon. On the strength of the growing faultiness of the letter "e" during the years from 1917 to 1921 on the typewriter in McDowell's office and basing his opinion on various other "characteristics" Osborn said it was his positive belief that the copy introduced by the defense was not written on the date it bears, July 7, 1917. (As indicated above the defense was willing to admit that the particular copy was not made until probably 1920 or even 1921, but insists that the original was written and mailed to Doherty in 1917).

In 1917 the "e" was reproduced almost perfectly, but gradually it became very defective, according to Osborn, who pointed out that the copy in question shows these defects to a marked degree.

Being cross-examined by counsel for the defense Osborne admitted having prepared many of the questions which the prosecution had asked him in direct testimony. He said no arrangement for compensation had been made but he hoped to be compensated for his services as expert.

Try to Introduce Tax Returns

The question of the admissibility of McDowell's income tax returns as evidence against him will be decided by Judge Killits at an early date. The government is in possession of them and, Prosecutor Pratt says, will endeavor to show that McDowell concealed the commission which he received on various deals that he negotiated for the Doherty interests while in their employ and at a time when, the government says, he was not supposed to accept commissions, but work for a salary and a fixed proportion of the net profits of the firm of H. L. Doherty & Co. This concealment, Pratt says, is a vital element in the case. The tax returns have already been added to the immense amount of paper read into the record, but so far have not been gone into in detail, the court having deferred its decision on the matter.

Herman J. Hendel, file clerk in the auditor's department of Henry L. Doherty & Co., testified that the papers which were taken from the office of McDowell in Pittsburgh were placed in his custody by the detective who brought them from that city to New York. He identified numerous letters as thus having come into his possession. However, he was unable to identify one of the detectives who delivered many of the papers as the man who handed them to him. He also said that only about 20 per cent of all the papers were taken to Toledo.

This admission caused the defense to complain to the court that its orders to have all papers in the case removed from the Doherty office to Toledo so that the defense could have access to them, were not obeyed, but the court refused to listen to it saying that, as far as the court was aware, Henry L. Doherty & Co. and the government had obeyed the court's orders to the fullest extent.

Prosecutor Pratt, using a loose leaf diary which McDowell kept during the decade from 1910 to 1920, showed during cross-examination of the defendant that while McDowell according to his testimony in this trial insisted upon a commission of $175,000 on the deal which involved the purchase of the Columbus, Medina and Mansfield properties for $1,750,000, the diary entry of Jan. 31, 1913, indicated that he expected only $35,000. McDowell explained that this $35,000 was only part of the commission, the entire amount to be apportioned to the three properties involved.

One day last week the court permitted a certain letter which Frank M. Lowry had written to his brother-in-law, C. A. Hill, to go into the record. The following day Judge Killits admitted he was in error when he gave permission to have the letter made part of the evidence and instructed the jury to disregard it.

Frank W. Frueauff, Doherty's sole partner, and his brother, Charles Frueauff, one of the attorneys for the Doherty interests, were called by the prosecution last Saturday to rebut what McDowell testified he told them when first confronted with the accusation that he had been found to have defrauded his employers. Frank Frueauff said McDowell did not say anything like that which he told in direct testimony during the trial. The prosecution has many other witnesses in rebuttal.

Prepare Defense In Natural Gasoline Case

Staff Special

TULSA, Feb. 25.—Aroused by the reported statement of attorneys for the Standard Oil Co., and the Hope Natural Gas Co., that action will be taken against natural gasoline manufacturers in case the Saybolt process is upheld as patentable by the United States circuit court of appeals, defensive action is being prepared by the Association of Natural Gasoline Manufacturers.

T. O. Sullivan, vice president of the Hope Natural Gas Co., has written that all absorption plants in the United States are infringing on the patents of his company, despite the fact that they may be operating at lower pressures. His statement is taken as a warning of the plans of the Hope company and is viewed seriously by the entire industry.

At a meeting of the executive committee of the association held here this week a committee was appointed to gather data on the whole litigation and report back to the association a plan of defense. C. R. Burke of the Oklahoma Natural Gas Co., was appointed chairman of the committee. A. J. Schlosser of the Barnsdall Corp., and G. G. Oberfell of Chestnut & Smith, were selected to aid in the work. One additional member of the committee is to be appointed later.

Complete information on all patents covering gasoline manufacture is being collected by the committee. It will study them carefully before making a report to the association on a plan of action. Particular attention is to be given claims of the Cooper-Garner patents of March 2, 1920, which have been purchased by the Hope company, in addition to the Saybolt process.

Data on the litigation to date is in the hands of Mr. Burke, due to his connection with the Oklahoma Natural. That company has borne the brunt of the case to date, having been sued by the Standard and Hope companies in 1917. It won the first decision in the case when Judge R. L. Williams of the federal court of the eastern district of Oklahoma, handed down an opinion on June 30, 1921, holding that the Saybolt process was not patentable.

It has been understood that the suit against the Oklahoma Natural is in the nature of a test case. It was brought after the Hope and Standard interests had sought to collect royalties from

(Continued on page 28)

Development Of Foreign Oil Fields A Long And Costly Task

NEW YORK, Feb. 25

By Lawrence E. Smith
STAFF REPRESENTATIVE

FROM the point of view of the man who is producing oil in a limited way, the Symposium on Foreign Oil Possibilities, held here Feb. 21 and 22 might have seemed wholly exterior to his business.

A second thought upon the subject should bring realization that this gathering was perhaps the most notable of this or any recent year. Its importance is predicated upon the assumption that the Mexican fields now producing are depleting and are due for exhaustion to the point that they no longer are factors in the world's market; that the visible supply of oil in this and other countries now producing will be far inadequate to meet consumption without Mexico and that new sources of supply must be found.

From this standpoint, the conference just held was of tremendous consequence to the entire oil industry. No apologists are needed, only an explanatory word that the significance of the conference may not be lost. The ability of the oil industry to serve the public fully; markets, profits, investments—all are involved. The foremost geologists and petroleum engineers of this country met to exchange information based upon years of study of foreign countries and in most instances, specialization to a large degree upon the country each discussed.

Outstanding Conclusions

Out of the conference there were several outstanding conclusions.

1. The Mexican light oil fields will be impotent as a market influence within a few months, two to five months being the range.

2. Wildcatting in Mexico to secure new supplies of petroleum is not being carried on with the diligence the situation warrants.

3. The South American republics hold big possibilities for oil production, but have been brought into no important stage of development as yet and cannot be looked to for any amount of oil of consequence for several years.

4. There is no region easily accessible or which will not require enormous investments over a long period before it will contribute to the petroleum supply. The work of pioneering in South American republics is largely still to be accomplished.

5. American operators can be aided materially by their government in entering foreign fields. One of these aids can be given by revision of the methods of handling government reserves, excessive bonuses and high royalties now prevailing give a bad impression of the possible profits in the oil business, this in turn leading to the imposition of often prohibitive restrictions by other nations, particularly the Latin American republics.

6. The conference method of getting before the industry the problems pertaining to the assurance of the United States' leadership in the oil industry should be continued through some organized body or other and a frank exchange of all data so far as is consistent with the plans of any company will greatly expedite foreign operations.

It was made clear at the outset that any estimates of foreign resources at this time are to be taken merely as starting points and not as final conclusions. In many of the countries discussed, the data procurable were meager or based upon partial knowledge and the conclusions set forth are largely guesses. A continuation of these conferences will add to and revise the data, thus aiding materially the operators who seek to exploit foreign oil territories.

Ralph Arnold, chairman of the oil and gas committee of the American Institute of Mining and Metallurgical Engineers, under whose auspices the symposium was held, stated in his opening remarks, published in another part of this issue, that the chief difference between the so-called practical operator and the geologist or engineer was one of time, the latter being seven or eight years ahead of the operator. For this reason, he said, the scientific men can be found always working with the operator to reduce to the uses of mankind the knowledge gained by the scientist.

Thus the knowledge acquired by the scientific men who have been spending their best years in the regions remote from civilization, is passed on to the operators freely and thus the necesity for the conference just held and others of a similar nature.

A point stressed by two of the speakers, Dr. Arnold being the first and Henry L. Doherty the other, was that the price making in the past year has been at least clumsily handled. Mr. Arnold went so far as to say that the"price fixing group," often come to believe it "is the inexorable law of supply and demand." Mr. Doherty, on a later occasion, believed "there was no justification in cutting the price of oil to the point of bankruptcy in June and the wild scramble to raise the price in September. There was a mistake one place or another."

Discouraging to Investors

These speakers made this point as contributing to the retarding of progress by the industry generally and the discouragement of sane investments in foreign resources, arguing that the time is likely to arrive when this country will find itself unable to care for the situation through failure to make the progress abroad it should.

In the papers on the foreign oil possibilities and the discussion which followed each, it was pretty well established that Colombia and Venezuela are to be counted upon first to contribute importantly to the supply of oil. Venezuela, of course, has had a considerable amount of development, so far at a loss, as Barnabus Bryan pointed out, but it has been merely indicaed so far.

Colombia is the center of the South American development just now. Chester W. Washburne, who with K. White contributed the paper on Colombia, believes the boom has pretty well flattened and that a true comprehension of conditions there has just begun to filter into the minds of the American industry. In this connection it may be mentioned that **National Petroleum News** some weeks ago published an article on Colombia, estimating the time when oil from there will reach the markets of the world at three to five years hence.

Mexico is the nation for immediate consideration, of course. Dr. Arnold characterized the industry in that country as being between the "devil" of taxes and revolutions, and the "deep blue sea," of salt water. The paper by V. R. Garfias, of the Henry L. Doherty interests, published elsewhere, tells of the restricted out look for important areas and the Isthmus of Tehuantepec area, a subject for considerable comment at this time, is discussed briefly by Mr. Garfias and in detail by Paul Wagner, of **National Petroleum News,** in another section of this issue.

American Oil is Reliance

Outside Mexico, Colombia, Venezuela and possibly the western provinces of Canada, the writer, after listening to the discussion of this body of international authorities on oil, can see nothing in the immediate future to affect the world's reliance upon this country for oil from within the confines of this country. Immediate future is used here to mean within two or three years. Everything else is so hopelessly remote as to be only "possible," within that time.

The recent estimate of nine billion barrels of oil in the United States, made by the United States Geological Survey and the committee of the American Association of Petroleum Geologists, was, when referred to in this conference, regarded as rather too low. David White, of the survey, commenting upon it, again stressed the point that the estimate meant oil recoverable by present methods and took no account of the possible great recovery by artificially applied pressure to oil sands. Other geologists alluded briefly to their belief that the estimate did not assign enough importance to the "possible", territory, this being differentiated from the areas considered "probable," and for which due allowance was made in the estimate.

"Not even the acquisition of foreign oil supplies," Dr. White said, "can prevent the necessity for the use of oil shales ultimately." The latter, however, is far from commercial exploitation, he said. Experiments should be encouraged by the government.

"If the time between the exhaustion of the Tamasopo limestone production (Mexico) is put to diligent use, in acquiring and developing foreign sources of supply," Dr. White said, "the strain will be far less and the effects less disastrous."

Huntley Discusses U. S.

Following the reading of the paper by V. R. Garfias, published in part on succeeding pages, L. G. Huntley, of Pittsburgh, discussed this country briefly. He agreed generally with the statements made by Mr. Garfias, he said, and anticipated that by September the present production of Mexico will be cut in half. He added that his information regarding the recently prominent wildcat of the El Aguila in the Tehuantepec country was that it had found big gas pressure and some oil

at below 3,000 feet and that the hole had been ruined.

Southern Vera Cruz, Chiapas and the Tehuantepec areas hold some possibilities Mr. Huntley believes. All else he regards as of no worth for present consideration.

The statement had been made earlier by Dr. Arnold that salt water had appeared in the Toteco-Cerro Azul fields, the remaining important light oil fields of Mexico. Mention of this was made in these columns the first of this year and was denied by the companies operating there. Dr. Arnold informed the writer that his information was authentic beyond question.

Earl Oliver, of the Marland Oil Co. who has been in Mexico arranging for testing on some of the big acreage Marland secured, urged as full an exchange of information among geological departments of companies in Mexico, as consistent with their plans. Conclusions reached as to regional geology, sub-surface information, could well be exchanged to the advantage of all concerned and without affecting the character of any one's enterprise, he believed.

Reserves of Canada

Beginning the discussion by countries, Ralph Arnold and Walter A. English presented a paper on the reserves of Canada, the paper being read by Arnold. They passed quickly from discussion of eastern Canada, the worth of which has been pretty well indicated, to the western provinces. Most of this territory is surfaced by pre-Cambrian rocks and hence held to be impossible. The present producing fields are not capable of much extension. Possibilities in the western provinces are fairly important and with the tests now going down in widely separated areas, the worth of this country should be pretty well determined by the middle of the coming summer, the co-authors believed.

Eugene Coste, once of the Canadian geological survey, and principal owner of the Bow Island gas field with pipe line to Calgary, dissented from the view taken by Arnold and English. The territory is so vast, he said, being in places 300 miles wide and a continuation of the Wyoming and Montana conditions, that it can not be dismissed from consideration by the results of wildcats now being drilled.

The Calgary boom several years ago resulted in the drilling of a large number of wells, but these were misguided attempts in most instances, he believed. He said he had drilled more tests than anyone else in that country and that his would not number more than 40, and these in a small area. The oil, when found in Alberta, Saskatchewan, Manitoba or eastern British Columbia, will be in narrow fractured zones not more than two or three miles wide, Mr. Coste believed. He further believes the deep rocks of Ontario have not been brought into the production they are capable of.

Criticizes Drilling Method

In reply to the criticism, Mr. Arnold says there is very little evidence in western Canada to work on and that any attempt to define the structural conditions must be done with the assistance of the drill on account of the heavy mantle of glacial drift which conceals the position of the rocks. So much of these provinces is flat, with few streams of depth enough to afford good outcrops, that the geology of this country is pretty much conjecture.

Mr. Coste criticized the drilling of the Fort Norman well by the Imperial Oil Ltd., saying that enough money was spent upon a hopeless proposition to finance the drilling of 50 tests in areas where oil, when found, could be marketed.

Dr. White, of the U. S. survey, was also opposed to the theory that this year will see the determination of western Canada's resources.

Little discussion was made of the paper by A. H. Redfield, of the U. S. Survey, on the West Indies, read by Dr. White. Seepages occur in Cuba in considerable number, generally in the serpentine, and the origin of this oil must be determined before intelligent drilling can be done. There is no production in these countries, although a number of tests have been drilled in Cuba.

In Central America, the paper on which was also by Redfield, and presented by D. F. McDonald, there is a considerable amount of interest. These countries are generally described as being absolutely inaccessible at this time and as requiring a vast deal of trail blazing before anything can be accomplished toward testing them. There are no producing wells, although the Sinclair interests got a gasser of some sort last year in Costa Rica, and no sections have been made public, said Mr. Redfield.

Mr. McDonald added that recent work had shown an eastward-westward trending synclinorium through the central part of Costa Rica and that in the Panama Canal excavation work, an Oligocene bed four to five feet thick was penetrated which gave off a strong odor of petroleum and gas seepage for several months.

Honduras Not Promising

Mr. Grant, who has recently returned from the Central American republics, says that his work in British Honduras convinces him that it is to be written off. Laws of these countries, he said, have not been favorable for prospecting and in some of the countries, the governments are more eager to get railroads built than they are to get oil, hence granting of concessions is apt to be contingent upon the construction of railroads. Mr. Grant says that the country he has been in has convinced him that petroleum will have to be very scarce before Central America will appeal as a land in which to spend money searching for oil.

A long discussion was developed by the presentation of the Washburne-White paper on Colombia, read by the latter. Mr. Washburne, after the reading of the paper, started the discussion by saying that in his estimation, the oil seepages which caused the excitement came from badly crushed rocks and that drilling in the region of these was apt to be disappointing, the oil having escaped through the fractured zones. He further said that the laws of the country and the transportation are such that development will be retarded materially.

Dr. White, of the U. S. survey, disagreed with Mr. Washburne's and other geologists' minimizing the importance of seepages, but agreed that they were not conclusive evidences of the presence of oil which can be exploited. He said that the presence of live seeps, such as characterize Colombia and South America generally, for that matter, is indicative of the existence of oil under tremendous pressure somewhere, but the tremendous thickness of the sedimentary rocks may make it necessary to drill to enormous depths before finding the reservoir rocks. He urged that more attention be paid to geological conditions not necessarily associated with seepages.

"Where would the United States be today as a producing nation, if we had relied wholly upon seepages?" he asked.

Facts as to Colombia

The Colombian paper printed in succeeding columns of this issue, goes into some detail as to the extent of development work in that country. It should serve to set at rest certain misapprehensions. Recently, newspapers, and one oil journal of national circulation, printed the statement that oil from Colombia would be on the market of the United States by the last of January, or maybe it was the fifteenth. Nothing could be more absurd. There are three wells of uncertain productivity, located far inland, in the enture country that can be considered commercial wells. The small production they are worked for is taken care of by the little refinery at Barranca, built by the International Petroleum Co., to fulfill the terms of the concession. All the gasoline made is used in that country and the fuel is used in firing the boilers of boats. The only oil that has come from there has been samples sent by the International to its Toronto office.

Ralph Arnold and Barnabas Bryan prepared the paper which dealt with Venezuela and the Guianas and Trinidad, the latter being mentioned only cursorily as having no particular bearing upon the future. Mr. Bryan has spent several years in Venezuela and has recently undertaken the task of telling the financial world something about the future of the oil business, from the standpoint of petroleum reserves, his articles being published in the Magazine of Wall Street.

It was Mr. Bryan's statement that the Shell interests, the principal producers in Venezuela, have not after 10 years persistent work, recovered gross as much as their investments and he warned against the hurried attempts to get into business in this country. The country holds rather important possibilities, the authors believed, but is not a factor to be reckoned with soon.

Standard Organizing Company

It is timely to mention here that the Standard Oil Co., of Venezuela is now being organized, an indication that the Standard people are planning soon to start development. Transcontinental Oil Co., of Pittsburgh, has recently announced that it has a concession of some 12 milllon acres, lying north of the Orinoco River. A party of geologists is now working there and it is said the company will drop parts of the acreage as investigation shows it to be impossible.

V. F. Marsters, now of Kansas City, read the paper on Peru and Ecuador, prepared by himself. He has made a close study of Peru, having spent some years there, but relied upon reports he has obtained by correspondence for his data on Ecuador. He believes Peru holds possibilities not yet indicated by such development and testing as had been done.

Wallace E. Pratt, chief geologist of the Humble Oil & Refining Co., prepared the paper on the Philippines, where he has done considerable work in government service. This was read by W. E. Wrather, of Dallas in the absence of Mr. Pratt. It provoked some discussion, particularly on the remarks made by Mr. Pratt as to the petroleum reserves of Japan, brought into the paper as beng in some respects analagous to the Philippine prospects. Mr.

Pratt's estimate, it was believed by Washburne, paid not enough attention to the "possible" sources in Japan.

Washburne spoke briefly upon Bolivia's prospects and geology, his remarks not being in writing and as no stenographic report of the meeting was made, cannot be published with the others in this issue. Bolivia is an inland nation and for that reason will possibly be held back behind the other South American countries in oil development, Mr. Washburne believes. Possible fields lie east of the Andes and from the Argentine boundary to 125 miles north.

Dr. J. C. Branner, of Leland Stanford University, prepared the paper on Brazil, read by J. E. Thomas. No discussion was provoked upon this subject, as this is one of the least known, geologically, of South American countries.

Eliot Blackwelder's paper on China and Siberia was followed by a discussion by Frederick G. Clapp, whose information Mr. Blackwelder pointed out, is more recent than his. Mr. Blackwelder's remarks tended to minimize the possibilities of these countries while Mr. Clapp took the view that nothing positive can be said about the possibilities of these countries as a whole in the absence of information based upon the use of exact methods. Mr. Blackwelder's paper, presented elsewhere, made it clear that he attempted to set forth only the known data.

Argentine and Chile were passed with brief mention by Washburne, Dr. E. W. Shaw, of the United States survey, who was to have read a paper on those countries, failing to attend because of illness. Washburne read he paper by J. Morgan Clements on Japan. A. Beeby Thompson, of England, who was on the program for discussion of Europe, Asia and Africa, was absent, as was R. N. Ferguson, who was to have spoken on Galicia.

Frank Feuille, of the Department of the Interior, read the paper prepared by himself and Edward Schuster on the oil laws of Latin-American countries, which is soon to be published and distributed by the Bureau of Mines as supplement to Bulletin 206, entitled, Petroleum Laws of All America. They pointed out the growing tendency of these countries to restrict the petroleum industry by legislation, taxation, or regulation as to spheres of activity.

Discussion on this subject which followed, brought the statement from a representative of the Shipping Board that a little house cleaning at home wouldn't hurt any and might be an incentive to more liberal treatment by other countries of the American operators. In the Philippines, he said, the supreme court of the islands has held that the mineral rights rest with the government. The Richmond Petroleum Co., subsidiary of the Standard of California, which is now drilling on Bondoc Peninsula, Luzon, found that in the event it gets oil, the army, navy, shipping board or government of the Philippine Islands has the right to take all the oil, not a royalty, at a price fixed by the department of agriculture in the islands. This is an effective bar to much development in the islands, the agent thought.

Other papers, dealing with subjects of interest to the oil indusry, were presented by Lester H. Woolsey, one time solicitor, on what that department can do to assist the oil companies in foreign development; a paper by Joseph E. Pogue, on the future demands on the oil industry of the United States, presenting methods of using available data; a paper by W. Irwin Moyer, of the Philadelphia Co. on time to pay out as a basis for valuation of oil properties; production problems of the Grass Creek, Wyoming field, by E. L. Estabrook, petroleum production engineer of the Midwest Refining Co., a paper by C. C. Rae on the possible origin of oil and a paper by K. Cottingham, of Columbus, O., on the Arches Fork anticline of West Virginia.

Henry L. Doherty, who spoke the second and last day of the conference, held that there is no justification for the sudden and drastic fluctuations in the price of oil.

The immediate needs, he held, were efficient storage methods revision of unnecessary restrictive laws, better salesmanship and adequate credit. The price fluctuations have been responsible for loss of considerable business, he contended. Industries which realized the advantage of fuel oil hesitates about converting to its use because of the uncertain supply and the variable price. Storage methods can be so improved, Mr. Doherty contended, that it will no longer be considered hazardous to store oil, nor will it be a waste. Then the factor of safety, or amount of oil held in storage reserve, will be so increased that a sudden and temporary jump in the daily production will not be considered imperative reason for cutting the price or prorating runs.

Better salesmanship is needed, Mr. Doherty contends. The oil products have been allowed pretty largely to sell themselves, so far as the public is concerned. He urged the continuation of this subject in future conferences.

The papers upon foreign oil possibilities are presented as fully as possible in succeeding pages and may, for all practical purposes, be considered a good general view of the stage of development of the remainder of the world, with the exception of the Russian, Persian, Indian and Dutch East Indian fields.

Refiners And Producers In Standard Group At Odds Over Price Situation

Staff Special

HOUSTON, Feb. 27.—A struggle for mastery over the crude price situation within the scope of the Standard Oil group of companies is being fought out at the present time. Refineries within that group are contending for lower crude oil prices, whereas the companies of strictly producing alignment are holding out for continuance of present prices, with perhaps occasional upward readjustments. The outcome hinges, at least to an extent, upon the trend of the daily production curve of the next few months in the domestic fields and to somewhat lesser extent upon Mexico.

Quick resumption of stiff demand for refined products would automatically remove one of the principal arguments of the refining group for lowered prices on raw materials. The more bullish of the producing group take the position that domestic crude in sight from new pools is not great in comparison with the normal decline of old wells and that a return of brisk buying of refined products will find the balance between production and refinery consumption more in favor of the producing side of the scales.

Atlantic seaboard plants which utilize Mexican crude for a part of their runs, and which obtain some 12 per cent recovery of lighter products from this raw material, are considered by the producing group to be on the verge of turning, at least in part, to domestic fields for their requirements. This opinion is based upon the Toteco-Cerro Azul production in Mexico declining to a normal stage in three to five months after which time the 17 million to 19 million barrels of oil being exported from Mexico is regarded due for a fall to 10 to 12 million barrels a month; and much of that quantity going into the world markets rather than in competition with domestic grades in the U. S., because of the control exercised by El Aguila (Mexican Eagle Oil Co., Ltd.) over a large part of the Mexican production remaining in sight after Toteco and Cerro Azul's decline.

Of the total amount of crude exported monthly from Mexico, some 60 per cent has been finding its way into the United States for months back. Should it prove that a flattening down of exports would find a similar percentage of 10 to 12 million barrels coming into the United States it would appear that the passing of Toteco and Cerro Azul would cut down by 50 per cent the amount of Mexican oil used in Coastal plants of the United States and marketed for fuel from importing stations.

Such contingencies are predicated upon the known sources of supply in Mexico not being replaced by other fields to result from "wildcatting" operations until the 225 million barrels in sight shall have been worked out. A dropping off of Toteco-Cerro Azul without the loss being replaced would tend to increase demand for Texas grades of oil in particular with the possibility that the last half of the present year will find the producing group in control of the price situation within the Standard alignment.

Until such time as demand for finished products becomes more brisk (and barring radical declines in producing areas of the southwest and Mexico) the producing group are more or less on the anxious seat. It was this producing group which in the later days of 1920 attempted to hold up the crude oil market to the $3.50 level for western light crudes and $6.10 for Pennsylvania grade against the insistence of the eastern refining group of Standard affiliation that the price must come down to solve the industry's problems.

Although $3.50 crude then compares with $2 oil at the present time and $6.10 crude compares with $3.25 oil now, (the ratio as compared to prices for finished materials also being readjusted) still the struggle as between the refining and the producing groups is not dissimilar in character.

In areas of temporary backing up of crude oil, which has created softness in the market situation, the smaller skimming plant operator, has some ray of sunshine peeking through the clouds. He has visions of the crude oil that he may be able to obtain, at least in small quantities at more favorable price levels.

Has Sold 10 Times As Much Property Under Hammer As Any Other Man

Staff Special
TULSA, Feb. 25

SALES of Osage leases at Pawhuska are always dramatic. The gathering of oil men of all standings in the game, from the smallest operator to the mightiest millionaire; the excitement attendant when unbelievable prices are bid for undeveloped acreage; the Indians looking on stoically, apparently unmoved as each minute sees further accretions to their already huge tribal funds; all this is part and provides a suitable setting. But the real star of the performance, the man who puts the thing over, the representative of the government and of the Osages who makes half-million bids come from the crowd is Colonel E. Walters, of Skeedee, Okla., dean of auctioneers, veteran of all the Osage sales, and a man who has, and merits, the confidence and esteem of all who are in any way connected with these sales.

There have been many jokes made at the expense of auctioneers because they universally assume, or have attached to them by admiring friends, the title "Colonel," but this doesn't go with Colonel Walters. He was christened Colonel by his parents, who probably decided from the lung-power he exhibited that he was a born auctioneer and that they might as well start him out right by equipping him with the name he should have to acquire later in the natural course of events.

Colonel Walters has lived in Indian Territory and Oklahoma for 53 years, coming to this part of the country with his parents when he was four years of age. During that time he has been intimately associated with Indians of various tribes, particularly the Cherokees and Osages, among whom he is universally known and loved, his father having been connected in an official capacity with the early Indian Agencies in the territory.

Vast changes have taken place in Kansas and Oklahoma since Colonel Walters' advent upon the scene. For the first years of his life here he had only Indian children to play with, there being no other white children. He was present as a small boy when the representatives of the United States government and the chiefs of the Osage nation met to sign the treaty by which the Osages gave up their Kansas reservation and agreed to accept the land from which they now receive such bountiful returns in the form of bonuses and royalties. It is his recollection that the Osages did not want to sign this treaty, not wishing to give up their homes and land to depart for a strange country, but were overawed by the size of the military escort which accompanied the government agents, and signed through fear that their failure to do so would cause them to be attacked by the soldiers.

This meeting took place in Kansas, and it is interesting to note that, according to the Colonel's recollection, Wichita at this time consisted of a trading-post, five saloons, a livery barn or two and a couple of feed-yards, while it is needless to say that Tulsa at that time simply did not exist.

Colonel Walters served for many years as a law-enforcement officer and as a secret-service agent for the U. S. government, afterwards drifting into auctioneering through handling of sales of farms and livestock among his friends the Indians. His activities in selling lands and leases for the government have not been confined to the Osage, as he has handled these sales in various parts of the country, notably in the vicinity of McAlester, Okla., where highly valuable coal lands have been sold at auction under his direction, realizing large sums for the

Colonel E. Walters

Indian owners thereof. In the past year, Colonel Walters, in following his vocation, presided at sales in 19 states and traveled 26,000 miles, which gives some idea of the scope of his activities. He has sold under the hammer a total of $100,000,000 worth of property, ten times as much as any other auctioneer.

One of the Colonel's proudest possessions is a diamond-studded medal given to him by the Osages in recognition of his services to their tribe, and he wears it proudly at all times. This medal, which is of heavy gold, bears, besides the large blue-white African diamond, a hand-wrought head of Chief Iron Tail, the famous fighting man of the Sioux, who was Sitting Bull's right hand man and adviser in that warrior's many battles with the white men, and whom the Osages look upon as a great hero. In desiring to pay a great honor to Colonel Walters, therefore, they insisted that the features of this war-like red man adorn the medal. many who were in attendance at the Osage sale of Feb. 3, 1920, will remember the occasion when the above-mentioned diamond was presented to Colonel Walters. At that time it was in a ring, but was afterwards re-set in the medal.

Colonel Walters says that the day of the auctioneer who could only "ballyhoo" and nothing else, is past, and that the work really requires level-headedness, tact, quick thinking and diplomacy all of which he imparts to students aspiring to follow in his footsteps, through his position as instructor in the Missouri Auction School, at Kansas City.

(Continued from page 24)

companies using a process which was alleged to infringe on the Saybolt patents.

Opinions have been obtained from attorneys representing the Association of Natural Gasoline Manufacturers covering subsequent action which may be expected if the patents are upheld in the appellate court. The attorneys believe that if the broad claims of the Saybolt patent are upheld that the owners of the patent will demand a royalty from all those obtaining naptha or gasoline by absorption from natural gas, and ask injunctions against them until royalties are paid. This will be the action providing the appellate court holds that a "naptha absorbing menstruum" is as defined in the Blau patent. If this question is not settled in the next opinion, but the general claims are upheld, an injunction might be obtained until this specific point is settled. In that case the operators would be compelled to operate under bond for an indefinite period.

Might Get Injunction

Probably the most far reaching opinion of the attorneys is that covering modifications of the Saybolt process. It is claimed that an injunction could be obtained and royalties collected from all those who obtain naptha or gasoline from natural gas by blending that product with another before finally releasing the gas for consumption, or passing the refuse gas through an absorbing menstruum, as is now done by some operators, before using it for consumption. This action would be taken even if the refuse gas is passed through the menstruum at a pressure under the 30 pounds above atmospheric pressure specified by Saybolt. It would be the assertion of the patentees that doing this would be a mere subterfuge, the gas having been first operated upon at the pressure specified, and the remainder of the process being a continuance on the way to the consumer.

Quoting from the claims of the patent, the attorneys point specifically to the statements of the patentees that, "Mention herein of materials and of modifications in procedure and in apparatus is by way of example and is not exclusive of other modifications within the spirit of the invention."

The patent claims describe the naptha absorbing menstruum as "Any natural liquid or semi-liquid bitumen in the crude state or of a product prepared therefrom by reduction, distillation or otherwise." It claims to cover as well the use of any hydrocarbon not a form of petroleum.

Favor Williams Decision

The decision of Judge Williams a year ago is believed to be equitable by the gasoline manufacturers who bring forward a lengthy history of gas absorption methods. The manufacturers assert that a great part of the data on absorption was not before the patent office when the Saybolt patent was issued.

Commercial use of the absorption process was made extensively long before the issuance of the Saybolt process both in Europe and America for the extraction of liquefiable hydrocarbon light oil from gases, is is claimed

Arkansas, Tennessee N. P. M. A. Jobbers Fight Objectionable Taxes

By Ward K. Halbert
STAFF REPRESENTATIVE

MEMPHIS, Feb. 25

OBJECTIONABLE taxation as imposed by Arkansas and Tennessee upon the oil industry, was the chief topic of discussion at the third meeting of the Arkansas and Tennessee Oil Marketers' Association, in the Chisca hotel here on Friday, Feb. 24. Without any parleying or deliberation the local organization made application to the National Petroleum Marketers Association, to become a part of the national body, and through General Secretary E. E. Grant of Chicago, the two associations were united.

The same proposition which the National Petroleum Marketers Association has been making to state and regional associations since the first of the current year, was made by Mr. Grant to the group in Tennessee and Arkansas. At the present time three or four local associations, embracing 12 or 14 states, have been absorbed by the national association, much to the advantage and improved usefulness ot both. The arrangements made with the several local bodies have not been exactly alike, however. For as Mr. Grant explained to the gathering here, it is the purpose of the national body to fit the garment on the individual, rather than try to force the individual into the garment. Nevertheless, the principles of each agreement are alike—details differing with the different needs of the locla associations

Tennessee Taxation

There are comparatively few Independent jobbers in Tennessee and Arkansas. Only 14 were in attendance at the meeting and that was about half of the eligible membership in the association. Although like other Independents, they have their share of grief with price cutters and donors of pump and tank equipment, the one big insect in the ointment in Tennessee, is taxation. To express it mildly, an oil marketer in Tennessee is exempted from no ordinary taxation and subject to all special taxes. Examining the list of taxes to which an oil marketer is subjected, it would seem that the legislatures since the Civil War had vied in an effort to outdo each foregoing one in levying on the oil business.

There is a state and county privilege tax, levied in each county separately. Its amount is determined by the population of the county levying the tax. Seldom does it fall short of $150 a year, and in Shelby county where Memphis stands, it is $1,000.

Each town can exact a city privilege tax also from the oil man. The amount of this tax is determined by nothing so much as the whim of the town authorities. In Memphis the city privilege fee is $500 a year. Smaller towns charge less but as much as they may reasonably hope to get. Both of the above mentioned taxes are on wholesale dealers. They apply only to bulk stations. The retail dealer—which includes each filling station—comes in for the same kind of a levy for the privilege of doing business; once to the city and once again to the state and county. The two combined retail taxes aggregate $30 per year per pump in Memphis.

Besides the special taxes exacted oil men are subject to ordinary ad valorem tax like farmers or anybody else. Once each year they pay to the state and county government, a percentage of the valuation of their tankage and houses and lands. And then they repeat to the city. And once a year they pay an ad valorem tax on the value of their stocks on hand.

Inspection Fees

But even these taxes are inconsiderable when compared with the cost of having oil inspected in Tennessee. The duty is legally provided for in two laws, passed at different times, which adds to the complication. Kerosene inspection costs 25 cents a barrel (42 gallons), and gasoline inspection costs 20 cents a barrel of 50 gallons. It is exactly two-fifths of a cent a gallon for gasoline and about five-eighths of a cent a gallon for kerosene. That makes it complicated but in round figures it comes to $32 on a car of gasoline and $48 on a car of kerosene. There is no inspection on lubricating oils.

Under state law gasoline inspection calls for a gravity test and for this reason some of the state's inspectors carry some sort of a laboratory instrument with them. Kerosene inspection calls for a flash test but it was the concensus of the meeting that there was very little of that ever done. More than one of the dealers in attendance at the meeting stated that it was customary for the inspector to call at their bulk stations once a week and procure from their manager a list of the cars received during the week, by car serial and capacity, and to subsequently submit bill for inspection.

Enormous Profit

In Tennessee they call them "Coal-oil Inspectors," and they are usually men who are friends of the powers that wield official gavel. The salary of a coal oil inspector is determined by the number of people living in his respective county—one inspector per county. Possibly he was paid originally by the number of operating kerosene lamps in a county but now the population and the number of kerosene lamps are in inverse ratio. However, the more people the more pay, and the highest paid inspector gets $125 a month.

The Diamond Oil Co., of Memphis pays inspection fees aggregating $1,500 a month in normal times. The Diamond is not the only oil dealer in Memphis—not even the only Independent—but it is plainly apparent that inspection revenue is currently more than it costs in large towns in Tennessee. There are 95 counties in the state and of course 95 inspectors with salaries varying with population or with gallonage. Whatever the difference in the pay of the inspector and the fee of the oil dealer amounts to, it goes to the state.

Federal Inspection

With a problem such as inspection and excess taxation, and with only a small possible membership, the Tennessee and Arkansas oil jobbers were earnest in their appeal to the National Petroleum Marketers Association to help combat the proposition. Although it is considered possible to prove the inspection law unconstitutional in its present form, it will be hard to get it eliminated altogether, and most oil men here as elsewhere, oppose oil inspection of any kind.

It was suggested by D. H. White of Memphis, that in his opinion oil inspection was a Federal function. Although admitting that its procurance was a long way in the future, he pointed out that Federal inspection would be the best—or rather the least burdensome. He expressed the belief that a capable chemist might be stationed at each refining center in America, paid by the government and authorized to place his seal on each outgoing car of petroleum products, thus eliminating the unending wrangle now in progress between inspectors in different states as to who gets the "grapes" from the interstate shipments. He expressed the belief that through such a plan, inspection would be well-done, not simply guessed at, that it would be cheaper, and that it would shut off one more avenue of political graft and administrational booty.

Quit Kicking In

Mr. White's company recently ceased to pay the state for inspection. Early last October the company filed a suit in Federal court in the western district of Tennessee, presided over by Judge J. Will Ross, petitioning for a permanent injunction against the state in the collection of either inspection fee. The state in turn filed a motion to have the case thrown out of court on a technical count. That motion was argued on Dec. 14, 1921 and the court took the decision under advisement. There the matter rests. No decision has been rendered, but that one company has ceased to pay inspection fees.

The inspection laws in Arkansas are very like those in Tennessee, enough alike that one might have been modeled on the other. The fee in Arkansas however, is one-eighth of a cent flat on both gasoline and kerosene.

Routine Business

Besides a thorough discussion of inspection and tax burdens, and a little cross-firing on the subject of "bootleg competition," there were some changes made by this meeting in the official personnel. As they stand now, the officers of the association are:

T. J. Gay, Little Rock, president; R. E. McKellar Memphis, secretary-treasurer; D. H. White, Memphis, first vice

president; M. F. Lackey, Little Rock, second vice president; and P. D. Alvis, Memphis; M. H. Senter, Chattanooga; E. R. Russell, Little Rock; and George Foland, Rogers, Ark., additional directors. It will be observed that the vice presidents and directors are divided equally between Arkansas and Tennessee. The division was made thus purposely.

The first meeting of the association was in Memphis on last July 12 where an organization was formed. The second meeting was in Little Rock, on Aug. 24, where constitution and by-laws were adapted. This was the third meeting. The officers are the same as first elected except that Mr. McKellar has replaced H. B. Watkins who moved out of the territory and Mr. Alvis fills the vacancy of Colyar Reese who is not now active in the oil business.

Social Function

The whole convention lunched at noon Friday at one round table in the Chisca dining room, and in the evening the party journeyed to Big Tree Lodge where D. H. White, on behalf of the Memphis oil men, was host. Dinner was protracted from 7 to 11 o'clock in the evening, during which time Secretary Grant made a national biscuit eating record. Those present at the meeting were:

P. D. Alvis, Colyar Reese Co., Memphis.

J. E. Bacon, Pierce Oil Corp., Little Rock.

S. S. Baker, Jack Reed Oil Co., Rogers, Ark.

W. H. Benton, Gibson Oil Co., Little Rock.

George Foland, Bear State Oil Co., Rogers, Ark.

T. J. Gay, Gay Oil Co., Little Rock.

E. E. Grant, National Petroleum Marketers Assn., Chicago.

M. F. Lackey, Pierce Oil Co., Little Rock.

R. E. McKellar, Diamond Oil Co., Memphis.

A. R. Pople, Diamond Oil Co., Memphis.

Jack Reed, Jack Reed Oil Co., Rogers, Ark.

A. G. Sherbel, Gibson Oil Co., Ft. Smith, Ark.

D. H. White, Diamond Oil Co., Memphis.

Guy S. Turner, Turner & Turner Inc., Memphis.

Seek To Speed Up Refinery Figures

By Special Correspondent

LOS ANGELES, Feb. 23.—The statistical department of the Independent Petroleum Marketers' Association has, for a number of months past, been very active in its endeavors to secure for the California refiners production and stock figures on refined products which would be available at earlier dates than heretofore.

The statistics now issued by the United States Bureau of Mines are the most authentic compiled on refined products that can be obtained, but these reports are issued from 40 to 60 days after the period for which they apply. By the time the reports from Washington are received on the Pacific coast it frequently happens that the conditions to which they relate have changed materially, and the statistics have little more value than as a matter of reference.

However, the receipt of these same statistics at an earlier date would render them of high value to coast refiners, enabling them to predicate their business with greater accuracy.

The association has been carrying on an extensive correspondence with the statistical division of the Bureau of Mines, urging H. F. Mason (formerly in charge of the monthly reports on refined products) to adopt a new plan of assembling the California figures. The suggestion was to have the San Francisco office of the Bureau collect the California figures and then release these figures to the Pacific coast industry at once. This would release this important information 30 days earlier than the present method provides—for the local bureau sends them to Washington where they are assembled in one table with the other states, printed and then sent back. Mr. Mason promised the association his support to further its plan.

On Jan. 1 Mr. Mason resigned from the Bureau of Mines, and it was feared that much of what had been accomplished had been lost. New hope, however, is filming on the horizon, for the association has just received word from the Bureau of Mines that a special advance sheet on gasoline statistics for the United States will be issued preceding its monthly report by several days.

This announcement is received with much satisfaction by the members of the association, but the effort of the bureau is still a long way from accomplishing the objective to which the statistical department of the association is working.

Form 1201

CLASS OF SERVICE	SYMBOL
Day Message	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a day message. Otherwise its character is indicated by the symbol appearing after the check.

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

CLASS OF SERVICE	SYMBOL
Day Message	
Day Letter	Blue
Night Message	Nite
Night Letter	N L

If none of these three symbols appears after the check (number of words) this is a day message. Otherwise its character is indicated by the symbol appearing after the check.

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NATIONAL PETROLEUM NEWS
CAXTON BUILDING CLEVELAND OHIO

DESPITE WEATHER CONDITIONS GASOLINE CONTROLLING ADVANCING PRICES LUBRICATING OILS SHOWING ACTIVITY ACCOUNT EXPORT DEMAND FUEL OIL STRONG ACCOUNT ANTICIPATED STRIKE

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OIL FIELD EQUIPMENT—NOTES OF TRADE

Buying For Immediate Needs Only, Features The Equipment Market

Staff Special

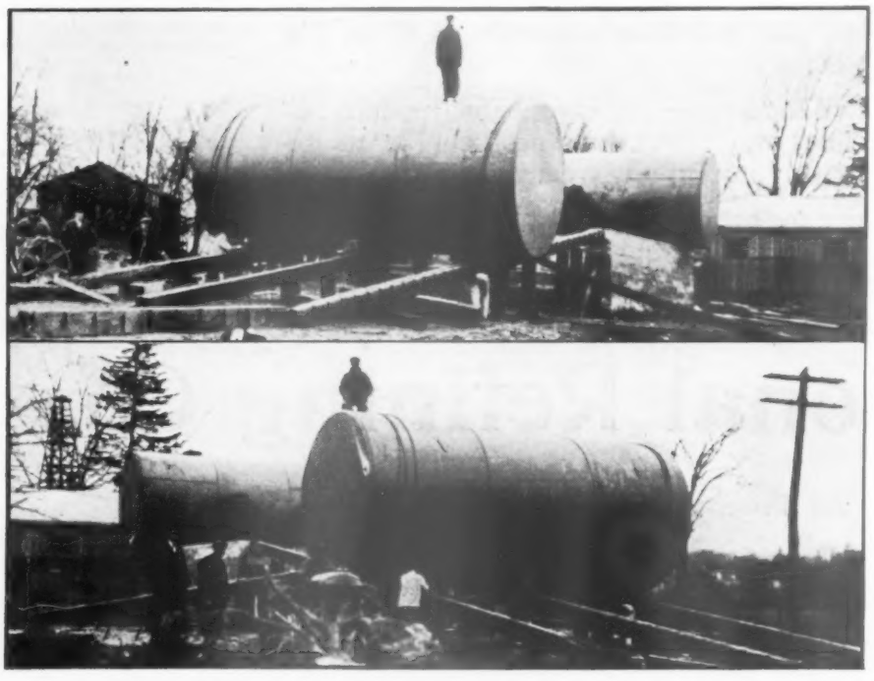
TULSA, Feb. 25

PRICES for oil field supplies showed little or no change over the past week, large orders being lacking, as far as can be learned. There is some demand for line pipe, mostly in two and four-inch sizes, to go into the district between Okmulgee and Henryetta, but in relatively small amounts to hook up new producing properties there with the main lines. It is understood that some pipe that was originally ordered for Mexia has been diverted to this section.

Rig contractors look for a slowdown in orders for rigs to be put up in the Osage country until a few weeks after the next Indian sale March 2. A good portion of the rig building business that developed in late December and through January and part of February was due to offsetting work on acreage purchased at the Dec. 12 sale of Indian lands. The Prairie Oil & Gas Co., Carter Oil Co., and Gypsy Oil Co. particularly launched on an intensive campaign right after that sale to protect their acreage which led to the drilling of many wells. Whether such a condition develops among companies which purchase acreage at the coming sale remains to be seen. Even though work fails to develop from this quarter rig contractors look for orders from other districts, as spring opens, to hold their business up to the January and February level.

Agents for the tank manufacturers report February their worst month in some cases since last August. Orders that developed in subsequent months were very largely due to the rush at Mexia; but that is virtually ended with the Sinclair and Prairie interests about the only people that are now putting up steel storage there. Within the last week the Carter Oil Co. bought ten 55,000-barrel tanks to go up in Hewitt. This company and the Sinclair interests have been storing crude there for the past several months, both companies putting up storage off and on. One other company had inquiries out for a few big crude tanks which were to go in near Henryetta. This to date had not developed to actual orders, however.

Prices quoted by the tank agents are $15,000 to $16,000 for 55,000-barrel tanks, quotations which all concur in stating are too low to allow a profit in the sale. The situation here has been complicated by the tendency of some of the Independent mills the past few months to break away from the practice established by the Steel Corporation and quote Chicago as a base price rather than Pittsburgh. This gives the western manufacturers an advantage of better than 40 cents a hundredweight over the Pittsburgh mills in freight rate and, in addition. the Chicago base price is about 10 cents a hundredweight under the Pittsburgh base price. This makes a condition that is giving the eastern tank manufacturers much concern and is largely responsible for the demoralized market on large storage.



Large Storage Tanks Being Rolled Into Place at Townsend Oil Co.'s Plant, Le Roy, N. Y.

Supply Trade Personals

Staff Special

HOUSTON, Feb. 25.—L. P. Netter, representing the Chain Belt Co., of Milwaukee, Wis., spent a part of last week in Houston, making the rounds of the oil industry with L. L. Childs, who recently became associated with his brother, W. L. Childs, in the Childs-Boykin Tool Co., and W. L. Childs & Co., in the Humble building. W. L. Childs is sales manager of the Boykin Machinery & Supply Co., of Beaumont.

* * *

Staff Special

TULSA, Feb. 25.—C. E. Meehan, formerly traffic manager of the National Supply Co., at Independence, Kans., has been placed in the Tulsa office in the same capacity. Mr. Meehan has been connected with the National two years, entering this service at the expiration of his war service.

R. G. Ayers, formerly with the Link Belt Co., of Philadelphia, has become associated with the National in its Tulsa office. He will have charge of Mid-Continent field operations for the Clark drilling engine.

Tractor Is Used To Place Storage Tanks

LE ROY, N. Y., Feb. 25.—The Townsend Oil Co. of Le Roy used a tractor recently to place two new storage tanks into position atop concrete piers. Heavy timbers were inclined from the ground to the top of the piers, ropes were placed around the tanks, pulleys attached, and the tractor easily rolled the tanks into place. The accompanying pictures show two stages of the operation. Elbert J. Townsend of the company said the tractor was used in grading, moving large timbers, and operating the concrete mixer at the new plant.

ATLANTA, GA., Feb. 27.—The Todd Oil Co., 422 Healey building, has opened a jobbing business here and installed storage for gasoline, kerosene and lubricating oils.

NEW YORK, Feb. 28.—The Standard Oil Co. of New Jersey, effective today reduced the export price of gasoline and kerosene in cases for export 1 cent a gallon.

Many business opportunities are to be found in the Oil Industry Exchange near the back cover of any issue of National Petroleum News. It will pay you to answer the ones that interest you.

Here And There

By Special Correspondent

NEW YORK, Feb. 25

EDWARD C. SICARDI, who has been elected president of the Union Tank Car Co. to succeed the late William A. Barstow, was vice chairman of the tank car committee of the American petroleum war service committee. H. E. Felton, now chairman of the Board of the Union Tank Car Co., was chairman of that committee. In that position Mr. Sicardi kept the tank cars moving throughout the period of the war.

Mr. Barstow was born in Cleveland in 1877 but lived most of his life in New Jersey. He entered the oil industry as a still fireman for the Atlantic Refining Co., shortly after his graduation from Yale. He later held various positions with Standard Oil companies and became associated with Union Tank Car Co. in 1914 as assistant to the president. He later became senior vice president and was elected to the presidency in April, 1919. Mr. Sicardi succeeded him as vice president.

E. C. Sicardi

* * *

KANSAS CITY, Feb. 24.—E. E. Grant, secretary of the National Petroleum Marketers Association, has joined the Oil Men's Club of Kansas City. Other members include: R. R. Irwin, vice president of the White Eagle Oil & Refining Co.; J. M. Calvin, Bonniwell-Calvin Iron Co.; H. E. Turpin, Luce Trunk Co.; J. B. Nicholson of the Fry Guarantee Liquid Measure Co.; V. H. Crandall, J. E. Dyer and W. T. Dinkins of the Sinclair Refining Co., and W. E. Himes of the Wheeling Steel Products Co.

* * *

CLEVELAND, Feb. 23.—Joe H. Whitaker, formerly assistant sales manager of the Pure Oil Co.'s Ardmore plant, was a visitor at the Cleveland office of **National Petroleum News** today. Mr. Whitaker left the Mid-Continent to open a Detroit office for the Pure Oil Co. in the capacity of manager. He has just been promoted to manager in charge of the Detroit-Chicago sales division with headquarters at Chicago. R. D. Walker, formerly with the Acme Petroleum Co., has been appointed resident manager at Detroit.

* * *

STAMFORD, N. Y., Feb. 23.—O. H. Edwards has opened a new garage with two gasoline tanks and is preparing for the coming of spring and summer business which is always good here as Stamford is a Catskill mountain resort. Little business is done in winter, according to Lynn Hallock, salesman here for the Lennox Oil & Paint Co., of Cleveland.

* * *

KANSAS CITY, Feb. 24.—Col. Ruby D. Garrett, a candidate for the Democratic nomination for mayor of Kansas City, addressed the Oil Men's Club Feb. 20. Col. Garrett told members of the club that it is important for oil men, as well as other citizens, to take part in all municipal, state and national elections.

* * *

LOS ANGELES, Feb. 23.—The Rosenberg Oil Co. has rebuilt, enlarged and modernized the Turner refinery here, which it purchased about a year ago, and a few months after a fire had badly damaged it. All products, including lubricants, are manufactured. S. R. Rosenberg is head of the company. He is establishing a chain of service stations.

* * *

CHICAGO, Feb. 24.—Arthur Stoll, formerly with the Western Oil Corp., has become manager of the fuel oil department of the American Petroleum Products Co., Peoples Gas Building.

* * *

KANSAS CITY, Feb. 24.—Don J. Butler of the Butler Manufacturing Co. has returned from Cleveland and Chicago.

* * *

SAVANNAH, GA., Feb. 23.—R. M. Demere of the American Oil Co., Savannah, has another outlet for his profits—a son.

* * *

EL PASO, TEX., Feb. 23.—The Rio Grande Oil Co. of El Paso opened a skimming plant at Phoenix Feb. 20. It has a capacity of 500 barrels daily and will run Burkburnett and Mexia crudes.

* * *

AKRON, O., Feb. 24.—C. A. Pierce, operating as the Pierce Oil Co., has purchased at a receivers sale the Servus Oil Co. of Akron. S. E. McFarren who is known to the gasoline and oil trade in this territory where he has been engaged in marketing for several years, is manager.

* * *

LOS ANGELES, Feb. 24.—The Ventura Refining Co. has just issued the first number of a house organ called "The Ventura Mission." It tells not only of Ventura's own business but also of that of Ventura customers with pictures of their service stations. Ventura maintains sales offices in Los Angeles, San Francisco, Oakland, Fresno and Colton. Jobbers in many other California cities handle Ventura gasoline and motor oils. Officers of the company are: W. P. Hammon, president; R. K. Barrows, vice president; C. Van Deinse, vice president and general manager; A. E. Boynton, secretary and treasurer; A. L. Dahl, assistant secretary; T. W. Okey, sales manager, and Frank G. Hobart, advertising manager. The company's refinery is at Fillmore.

* * *

TULSA, Feb. 24.—In preparation for the construction of additional storage for its West Tulsa terminal the North American Car Co., Chicago, is laying trackage which will reach a total of 2,500 feet before spring. The company expects to construct 85,000 barrels of gas, oil and clean tankage in the near future to add to its present capacity of 210,000 barrels.

Edmund D. Brigham and Godfrey M. Brigham of the company are in Tulsa superintending the new building.

* * *

EL PASO, TEX., Feb. 23.—Marriage seems to be epidemic among the members and employes of the Rio Grande Oil Co. Three of the partners, L. E., L. M. and A. M. Lockhart have been married in the last 12 months. Three of their employes also have been married and three more are reported to be bethrothed. It must be the climate, remarks A. M. Lockhart.

* * *

LOS ANGELES, Feb. 24.—The refinery being built by the Sierra Oil & Refining Co., at Leesdale, Ventura county, to manufacture lubricants from crude obtained from the Cooper Petroleum Co., will not be ready to receive runs until about April 1.

* * *

COLUMBUS, GA., Feb. 23.—Motorists, instead of muffins, will be served henceforth at 1208 First avenue, Columbus. For at that address the filling station of Kyle Bros. Auto Co. will dispense Community gasoline. The Daffodil tea room formerly occupied the building.

* * *

SAVANNAH, GA., Feb. 23.—The Gulf Refining Co. announces the opening of two drive-in filling stations this week. The stations, A. Steele, the Gulf agent here says, are equipped with everything for the convenience of the motorist.

* * *

BAY CITY, MICH., Feb. 24.—Harold C. Bellows is opening filling and tank stations in Bay City. He expects to make the filling stations among the most modern in the state.

* * *

SAN FRANCISCO, Feb. 24. Frank E. Carroll, Pacific coast manager of the New York Lubricating Oil Co. recently returned to San Francisco from a two weeks' trip through the Pacific northwest where he went to look over business conditions.

The result of Mr. Carrol's trip was the conviction on his part that 1922 will be a prosperous year in that territory. He encountered a general feeling of optimism which indicated to him that the buyer will be in a better frame of mind in the near future.

The Osage Railway Builds Into Shidler

Prices Of Lots Go Up With Each Thousand Feet The Track Gang Lays; Streets Named After Big Oil Campanies

Staff Special
TULSA, Feb. 25

ALLOW us to present Oklahoma's newest oil town and coming metropolis of the western Osage country—Shidler, center of activity of the famous Burbank pool and the terminus of the newly-constructed Osage railroad.

Those who are familiar with the west side of the Osage know the vast stretches of rolling prairie, typical of that part of the country. Imagine, then, a tract of 160 acres, exactly like every other similar tract for miles around, and scatter liberally over it little white stakes indicating lots and blocks as determined by surveyors. Give it a background of derricks and blue sky—and nothing else.

Now return after two months' absence from the scene—and behold a city sprawling all over the quarter-section where there was naught but stakes before. Substantial buildings line the streets in all stages of construction, all being rushed to completion. Automobiles fill the streets as far as the streets go. Brand-new signs inform the motorist as to the name of the thoroughfare and warning him to park his car in the center thereof. Real-estate offices, stores, restaurants, filling-stations, supply houses, lumber yards, drug-stores, movies, are elbowing each other for advantageous locations. For the climax a railroad is building right into the town. Can you beat it? You can't even tie it, according to the enthusiastic Shidler boosters, and they say they haven't even gotten well started yet.

Lots Rise to $3,000

Shidler's career had its inception on Dec. 17, 1921, when the lots in the townsite were put on sale, and an index of its growth since then may be seen in the fact that lots which sold on that day for $750 have since been sold for $3,000—and there are many lots along Cosden avenue which could not now be bought even at that high figure, as their owners are erecting on them, or will start in the near future, substantial brick store building in which to house their various activities. To quote one of the town's most enthusiastic boosters, it would require a "fabberlus" price to tempt any of those merchants to part with their holdings at this time.

The sale of lots is in the hands of Shidler Townsite Co., of which E. J. McCurdy of Pawhuska is secretary, and in active charge of the sales. A warranty deed and abstract of title is being given with each lot sold, the deed bearing the special provision that all mineral rights are reserved to the Osage nation, the transaction conveying only the surface. The land upon which the townsite is located is described as the southeast quarter of Section 28, T. 27 N., R. 6 E., and was originally the allotment of James Pappan, a member of the Osage tribe. An oil mining lease covering this quarter-section will be sold to the highest bidder at the next sale of Osage leases, to be held in Pawhuska, March 2, being designated as tract No. 18, and is one of four tracts to be offered in the immediate vicinity.

Bought for Pasturage

Shidler derives its name from the owner of the land upon which the townsite is located, E. S. Shidler, president of the Citizens National Bank of Pawhuska, who purchased the surface rights to this and other tracts in the vicinity for pasturage purposes before the Burbank pool was dreamed of. He is also, incidentally, the owner of a 4,000-acre ranch in Kay county, adjoining the west side of the Burbank pool, which has a potential value running into millions. We want to go on record now with the information for the uninitiated, who might otherwise err in this important matter, that the name of this town is not "Shiddler"; the "i" therein is long, as is the main street, and as must be the purse of the would-be purchaser of business-sites in the newest town.

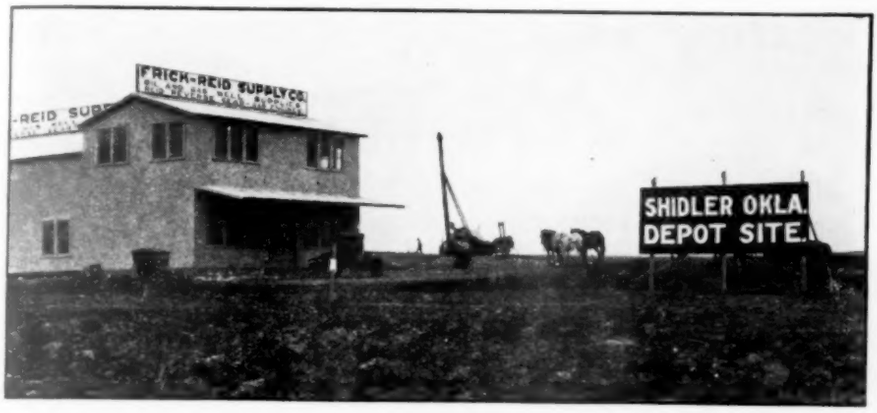
The railroad which will put Shidler definitely on the map, and the progress of which was being feverishly watched by all the inhabitants as the "end of steel" approached the town at the rate of about a mile a day, is known as the Osage railway, and is 10½ miles long, connecting with the Midland Valley at a point about three-quarters of a mile east of Foraker. Rapid construction work has featured the

General view of Shidler, Okla., looking north on Cosden avenue.

Tracklaying gang of Osage railway approaching Shidler.

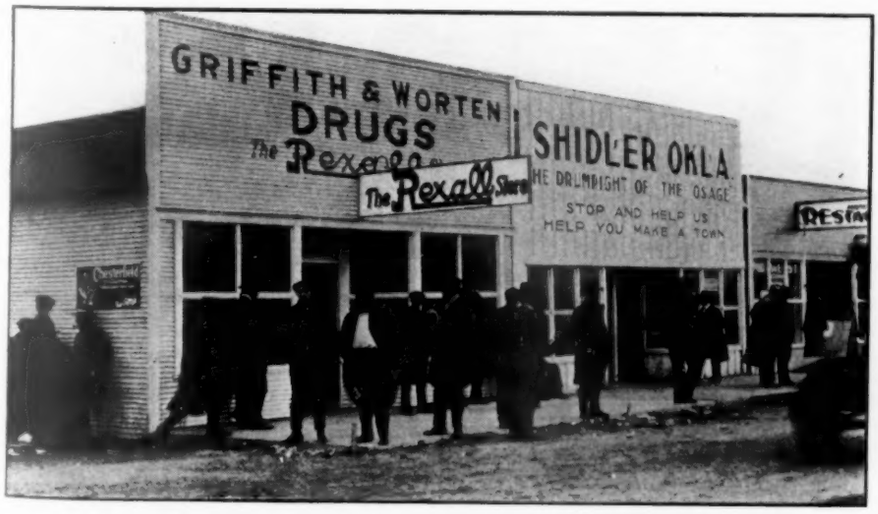
building of the line—so rapid, in fact, that in one or two places where the contractors had not been able to complete their cuts by the time the track-laying gang arrived, the gang simply laid their rails around the hill through which the cut was to have led them and proceeded on their devious way.

When we were there, the rails had been laid to a point a little over a half-mile from the Shidler station grounds, with the expectation of finishing up the next day. Headquarters at the Townsite office was kept in constant touch with the situation at the front by runners who reported almost the laying of every rail, while those in the office were kept busy trying to figure how it was possible for the line to be finished before night, although the gang called it a day before all these calculations could be completed, and while still probably 1000 feet from their final objective.



Frick-Reid Supply Co.'s store at Shidler will be convenient to the station.

First filling station at Shidler, George A. First, manager, handling Marland products exclusively.



Broadway and Cosden avenue, southern addition to Shidler.

Building Moves Fast

Knowing how they do things in Shidler, it is safe to assume that trains are operating over the line now, and that the railroad station is one of the sights of the town, instead of merely one of the sites.

Official announcement from the railroad was to the effect that they would begin hauling in consignments of freight Feb. 23, and it was said that they already have 4,000 carloads consigned and accepted for Shidler. The railroad runs in a northwesterly direction through the town and owns a strip of right of way 304 feet wide; this strip has been cut up into 54 lots, all of which have been leased by various supply companies, oil companies and lumber yards, who are now rapidly constructing their stores, warehouses, offices and other buildings, and many of them have bought land adjoining the right of way as well, in order to have more room and to build houses for their employes.

Companies Holding Leases

Among the companies holding these leases, and who have either built or are building on their sites, are: Walker Lumber Co., Superior Tube Co., Producers Lumber Co., Gypsy Oil Co., Oklahoma Tool & Supply Co., Hinderliter Tool Co., Sinclair Oil & Gas Co., Bridgeport Machine & Tool Co., National Supply Co., Atlas Supply Co., Carter-Clote Lumber Co., Republic Supply Co., Tidal-Osage Oil Co., Tulsa Rig, Reel & Mfg. Co., Dickason-Goodman Lumber Co., Frick-Reid Supply Co., Prairie Oil & Gas Co., Jarecki Supply Co., Western Iron & Foundry Co., Black, Syvalls & Bryson, Murry Tool & Supply Co., and Oil Well Supply Co.

The Shidler Chamber of Commerce was organized Feb. 15, with about 100 members. William Gruber of the Midland Supply Co. was elected president, and the board of directors is made up of managers of supply-houses, lumbermen and merchants. At a meeting of the chamber held on Feb. 21, a committee was appointed to work toward an organization of the town for the purpose of incorporation. In the meantime law enforcement is in the hands of the county commissioners, of which W. T. Leahy is chairman.

The names of Shidler's streets read like a roster of Burbank producers; the first street on the west side is Gypsy avenue, after which come Cosden, Phillips, Sinclair, Marland, Peters, Prairie and Devonian avenues. Cosden avenue is, so far, the principal thoroughfare, but the most appropriately named street is Prairie—for that is just what it is from there on out.

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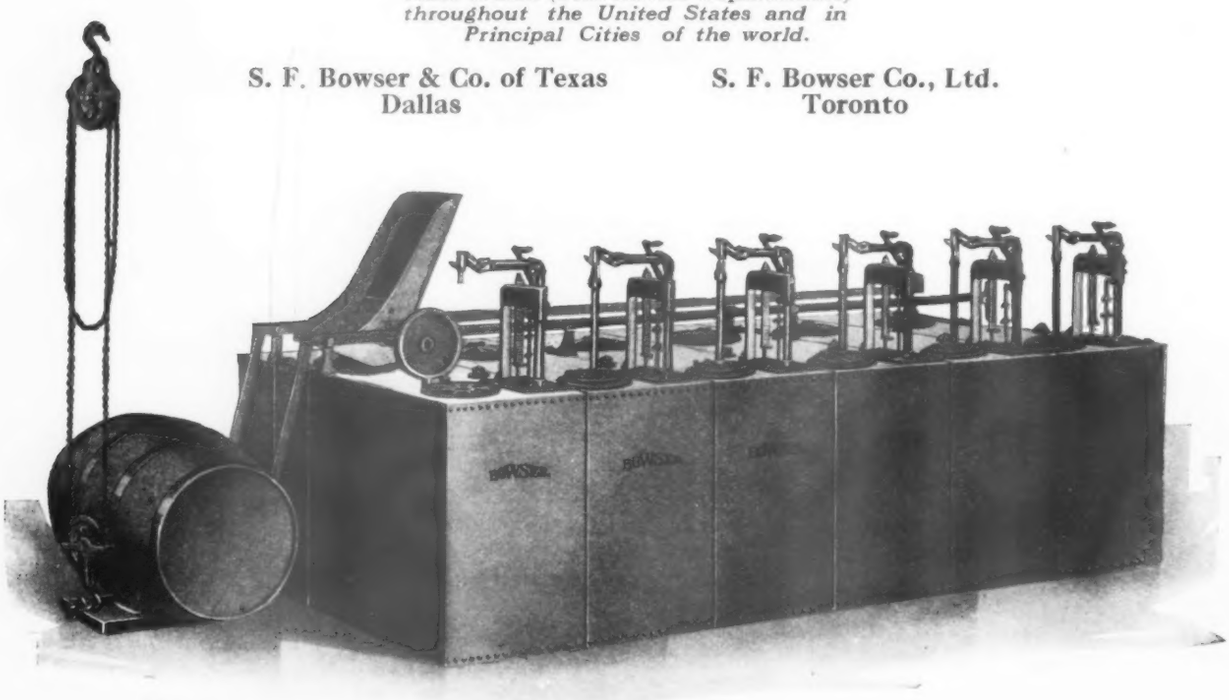
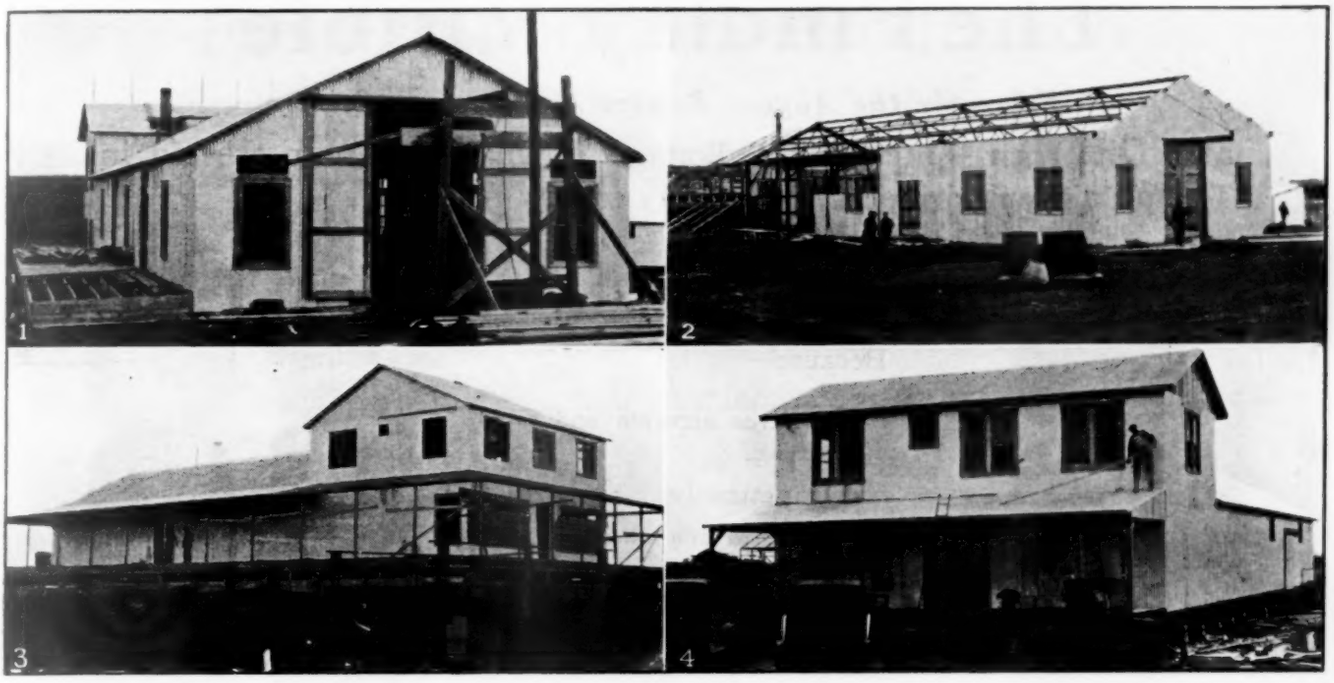


Supply Companies Furnish Shidler's Big Building Operations



1.—Bridgeport Machine & Tool Co.'s machine shop at Shidler, Okla. 2.—Steel-frame shop and warehouse of the Oil Well Supply Co., Shidler. 3.—Atlas Supply Co.'s store and warehouse, under construction at Shidler. 4.—Store, office and warehouse of Republic Supply Co. at Shidler.

Call For Standardizing Threads On Casing Used On Mid-Continent

Staff Special

TULSA, Feb. 25.—Heads of supply companies in the Mid-Continent field and operating heads of some of the larger producing companies are giving serious consideration to the confusion that has arisen in the use of both 10-thread and eight-thread DBX or California casing in field practice for drilling wells of 2500 feet and over. For identically the same size and weight of casing, it is quite common now for producers to call for either a casing with 10 threads to the inch or the same thing with only eight threads to the inch. This has caused duplication of stocks on the part of the supply companies and sometimes confusion in the field, where attempts are made to use the same size and weight casing with different threads in a drilling operation.

DBX casing, also known as "Coalinga Specifications" or "California Pattern" has only come into use in the Mid-Continent field within the last few years, having first been used in the California fields, where the depth of the wells necessitated a casing where the maximum possible strength could be secured at the joints. Early eastern practice was to use a coarser thread on the heavier sizes of casing. In any string of casing the joints are the weakest places. With a coarse thread, the cut for the threading is deeper than with a finer thread which will run more threads to the inch, and the greater the chance is for the joint to break with a coarse thread, particularly if the last thread is not fully covered by the collar. On the other hand the finer the threading runs, the greater chance there is for the threading to be stripped, as the cuts are not as deep in the metal. The finer the threading also the greater time must be spent in "making up" the joint, that is screwing the new joint into the collar.

California operators and pipe manufacturers got together on the matter and decided on a 10-thread casing as having the necessary strength and allowing for rapid screwing up without having the depth of cut of the coarser thread, and the 10-thread casing is uniform now in field practice there.

When deep drilling was taken up in the Mid-Continent field and the DBX casing came into use here, some of the Mid-Continent companies refused to accept the 10-thread style and called on the manufacturers to make the same sizes with eight threads to the inch. The pipe manufacturers protested; but competition for the oil field business led them to go ahead and put in stocks of the latter type.

The greater use of DBX casing has served to accentuate the confusion that thus came about. It is impossible to distinguish between the 10-thread and the eight-thread casing except by examining the collar. The success the Standardization Committee of the Purchasing Agents Association, under the direction of J. R. Stockton, purchasing agent for the Producers & Refiners Corp., had in standardizing rig irons has led both the supply people and the oil companies to believe that it could successfully end the present confusion and decide on as standard in the Mid-Continent field the particular thread of casing that is in most general use. Mr. Stockton has been called on by the head of one of the principal supply companies to take the matter up with his standardization committee and it is very likely that the committee will take action. It will probably first make an investigation to determine what threading is the best from a field efficiency standpoint and will then try to get the oil companies to adopt only casing with this threading and to have the manufacturers stop making other types.

It has been suggested that the work could be made broader in scope by having the committee adopt standard threading for the various sizes of casing, as well as those appearing in DBX casing, and including various sizes of line pipe also.

LOS ANGELES, Feb. 23.—The taking of testimony in the case of the Universal Products Co. vs. the Standard Oil Co. of Indiana, involving infringement of the Dubbs patent for cracking of petroleum, has begun in this city. Master in Chancery Holmes of Kansas City (as the case is before the federal court in Kansas City) is presiding. Attorney Frank Belknap of the Missouri city, and Robert O'Connor of Los Angeles, are representing the plaintiffs.

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Tehuantepec Believed To Be Important Field For Future Production

TAMPICO, Feb. 24

By Paul Wagner
STAFF REPRESENTATIVE

ONE OF THE important sources of future oil production in Mexico is the Isthmus of Tehuantepec region. That is the opinion of most of the more important oil companies making headquarters at Tampico. This opinion is based upon the results obtained in the well of the Compania Mexicana de Petroleo "El Aguila," S. A. (Mexican Eagle Oil Co., Ltd.) in Concepcion, lower Vera Cruz state. This well flowed at a rate variously estimated from 1000 to 5000 barrels from a depth of 3012 feet last December.

It is now established that the test reached a sand stratum roughly 300 feet below the lime formation that exists in the northern part of the state of Vera Cruz. This test, and others made in years past, is causing the companies to scout the Isthmus region thoroughly and formulate their prospecting plans.

The Isthmus of Tehuantepec area is of entirely different geological character than the present developed fields. In the area between Tepetate and Alamo (known as the Southern district) oil accumulation is along a "knife edge" fold that follows closely a major fault that lines up along the west side of the structure. Here oil accumulates in "cavernous" reservoirs below the Tamasopa limestone and rides on an underlying salt water table that provides tremendous hydrostatic pressure.

Analogous to Oil Tank

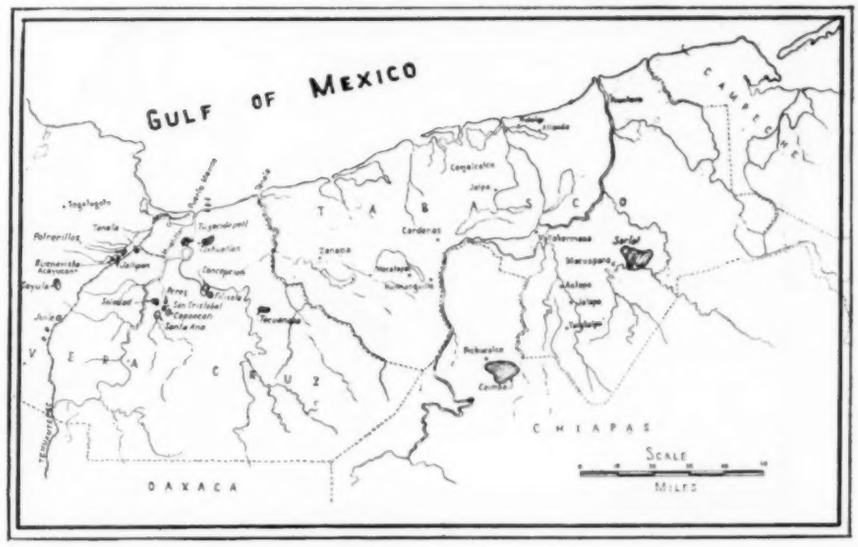
Wells drilled in the Tepetate-Alamo section, near the center of which present large production is rapidly draining the Toteco-Cero-Azul pool, bear much the same relation to the underground reservoirs as a given number of outgoing lines bear to a crude oil tank. The larger the number of wells the more quickly the pool, or "high spot" is drained, similarly as the larger the number of outgoing lines from a tank of oil the quicker it is possible to empty it.

In the Isthmus of Tehauntepec territory, however, the sand showing in the Aguila test is in relation to salt dome structure. This salt dome accumulation, while not necessarily identical with the saline dome development of the Gulf Coastal region of Texas is more nearly like the latter than other known fields.

Conditions learned from actual development are lacking in the Tehuantepec region but to form an idea one may consider the salt dome production in the Gulf Coast of Texas. This has been usually of very flush character and sometimes of extraordinarily erratic nature. In Texas, the shallow oil of a decade ago was found at the cap-rock level and it was not until the last few years that drilling operations were continued to 3000 feet and as deep as 4000 feet, where important production comes from spots on one or more sides of the saline domes.

In the Concepcion territory, which lies inland from Coatzacoalcas (Puerto Mexico) and Minatitlan, there was a limited amount of shallow production that years ago helped to supply the raw material on which the old S. Pearson's Sons, Ltd., refinery operated.

Afterwards deep tests were drilled in an effort to develop production at the approximate level where the present well came in. In its sanding up proclivities, the Aguila tests is not unlike the wells in the Gulf Coastal Texas area, where it is often necessary to set screen and take other precautions against just such developments. When cleaned out the Gulf Coastal Texas wells frequently produce from 15,000 to 25,000 barrels daily and more frequently than not these wells are good for 5000 to 10,000 barrels daily in their early life. The No. 1 Abrams of The Texas Co., at West Columbia, Brazoria county, Texas, made some 28,000 barrels daily at its maximum and in the first 15 months of its life produced approximately 2,000,000 barrels of crude petroleum.



Impossible to Clean Well

In the case of the Aguila well at Concepcion, regarding which the company will say nothing it was not possible to clean out the well after it had sanded up because the tremendous pressure threw a huge pyramid of sand just outside the derrick, in addition to clogging up entirely the hole itself. The tools are still in the hole which it will be impossible to clear for a producing well. Another hole is to be put down immediately which will test the possibilities of the adjacent territory.

It will be recalled by the American operator that often times years are required in which thoroughly to test the possibilities of a Texas salt dome. The top of the salt core is ascertained by the drill, after which a campaign is laid out that carries test wells down the sides in the direction where oil accumulations are believed to exist. Frequently that part of the dome where test drilling is pursued proves to be barren. Then a policy of "edging" outward from the salt core at the top of the dome is pursued in another direction and the locations are so placed as to make a thorough testing possible.

Although ordinarily the northeast side of a dome is found to be productive in the Gulf Coastal territory of Texas more often than are the other sides, such does not always prove to be the case. The result has been that frequently years have been required thoroughly to test one of these domes and then perhaps a spot of less than 100 acres will yield commercial quantities of oil, though frequently from 50 to 100 million barrels final recovery for the specific dome.

Territory is Favorable

Not only at Concepcion but elsewhere in the lower part of the state of Vera Cruz, where shallow production was found at Ixhuatlan, Tuzandepetl, San Cristobal, Capoacan, and elsewhere, lies territory considered favorable for deeper test drilling. The same statement may be made also of the states of Tabasco and Chiapas, where Sarlat and Caimba test operations have been made in other years.

The district in the southernmost part of the state of Vera Cruz is reached through the deep water gulf port of Coatzacoalcas (renamed Puerto Mexico) and by rail via the Tehuantepec National Railway; also by shallow draft river craft up the Coatzacoalcas river. Craft drawing from 20 to 22 feet can go up the river as far as Minatitlan, which is some 20 miles distant from Coatzacoalcas. The river branches out beyond this point and is both narrow and crooked farther inland, as well as somewhat shallow. Craft is limited to draft of six to 10 feet for a distance of some 30 miles farther up the stream.

In this district, all early exploratory work was done by the Pearsons, now "El Aguila."

This exploratory work resulted years ago in the development of the San Cristobal shallow pool, about 50 miles from

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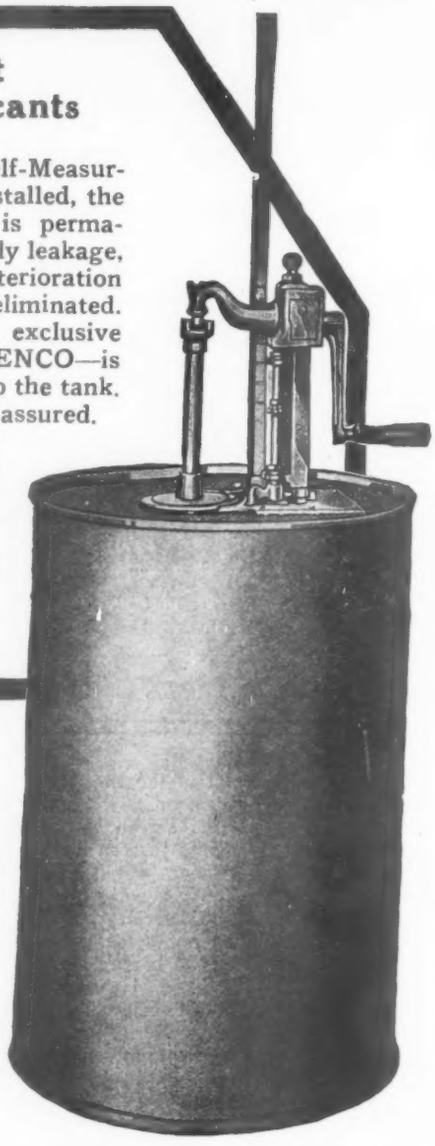

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Coatzacoalcas. Production came from the 150 to 300 foot levels. Three miles down the river, at Soledad, similar small production was later developed at 650 feet.

Up the river from San Cristobal, at Texcuanapa, a cable tool test developed small wells of approximately the same grade of light oil at roughly 1200 feet. On the Concepcion property small shows were also developed in a deep test, but operations were allowed to lag when the "gusher" production of the area south from Dos Bocas to the Tuxpam river became known as early as 1908.

Extensive Tests Planned

Eastward in the Tabasco area, in heavy, rolling lands inward from the gulf port of Frontera, surveying parties carried on preliminary work in the states of Tabasco, Chiapas, Campeche and Yucatan as early as 1911. Fresh activity has been reported from that territory over the last 12 months and now the John Hays Hammond interests, which operate in the Tampico-Tuxpam territory as the International Petroleum Co., are reported planning extensive testing operations. Nearly all the larger operating companies active in Mexico have some acreage in the Isthmus territory, notwithstanding that the Aguila is reported to control more than 80 per cent of the known salt domes in the general area.

The only practical means of reaching the territory inland from Frontera is by water, there being no railroads in the state of Tabasco. Such exploratory work as was done years ago in this territory was by the Pearsons also, these testing operations being along the upper part of the Tepititan and Tulija rivers. The most important of these tests was on the Sarlat property, some 12 hours distant by fast power craft up the river from Frontera. Some 15 holes were drilled, some shallow and others deep. Fully 60 per cent of them were lost and all but two abandoned, the drilling, however, being confined to an area of less than 300 acres.

In Sarlat wells, from 80 to 100 feet, there was developed oil in quantities of three to 10 barrels, of about 30 gravity, dark brown in color and containing little if any naptha.

Showings from 40 to 50 barrels each were obtained in two test wells that reached levels of 1700 and 1900 feet. In these the oil tested 40 to 45 gravity as compared with 38 gravity reported to have been tested by the deep salt dome crude more recently encountered at Concepcion, lower Vera Cruz. Both the Sarlat wells were lost in efforts to drill them deeper.

Gas Found Years Ago

A show of gas was reported years ago in a "wildcat" hole drilled by American and Mexican interests some 40 to 50 miles from the port of Progreso, Yucatan, and at a point close to the Tabasco-Chiapas state line, above the town of San Juan Bautista (renamed Villahermosa), the Anglo-American Oil Co., Ltd., some 12 to 15 years ago developed three wells making 50 barrels asphaltum bas crude after putting down six or seven tests, the deepest of which was to the 2500 foot level. Two or three other holes had shows but not in commercial quantities.

The Grijalva river, on which Frontera is situated about six miles inland from the coast, is the largest stream in Mexico. Sea-going vessels drawing more than 20-feet of water can navigate the stream for a distance of some 50 miles and those with draft of 15 feet can go perhaps 100 miles further inland. It will be necessary, however, to accomplish this phase of navigation either to clear a rather wide and

difficult bar through which entry to Frontera is obtained or to lighter craft drawing more than 12 feet.

For the most part the Isthmus territory is described as very boggy and overrun with water in the rainy season, making necessary before a maximum development can be pursued the building of "corduroy" roads and the construction in many instances of other facilities no less stupendous than the empire-building tasks under which the oil companies have labored at great expense to make habitable and exploitable the oil producing area in northern Vera Cruz state, some 50 miles south of Tampico and some 30 miles southwestward, in the so-called Southern district and the Panuco territory, respectively.

Indiana Court Upholds Old Inspection Levies

INDIANAPOLIS, IND., Feb. 25.—After a battle between political factions both of whom were engaged in the inspection of oil in Indiana in 1917 and 1918, the state supreme court has handed down a decision upholding the claims of one inspector for inspection fees although the statute under which he operated was declared by the federal court to be unconstitutional.

Fees which will amount to at least $160,000 were involved in the decision and, it is the opinion of observers here, suits to recover that amount may be brought against the Standard Oil Co., Indian Refining Co., Tiona Refining Co., Great Western Refining Co., National Refining Co., Moore Oil Refining Co. (Pure Oil) and several smaller companies.

The history of the Indiana inspection fee fight is an interesting legal story. In 1891 the General Assembly of Indiana passed an act providing for the inspection of petroleum products and provided that the state supervisor of oil inspection should be appointed by the state geologist. This gave the Democrats the appointment. In 1901 a Republican General Assembly passed an act purporting to cover oil inspection, repealing all prior laws and provided that the governor should appoint the supervisor. This act turned the oil inspection bureau over to the Republicans.

In June, 1917, L. Ert Slack, counsel for a number of affected oil companies, attacked the constitutionality of the act of 1901 in the federal court in Indiana and subsequently the court held the act invalid.

This decision of the federal court left the act of 1891 and also one of 1881 stand as the oil inspection laws of the state and the geologist, who was still a Democrat, appointed one of his partisans, Adam H. Felker, supervisor. The governor, a Republican, also appointed one of his partisans, Marion Caldwell, and the two with their deputies conducted separate inspections, each charging fees.

In July, 1917, Caldwell instituted an action against Felker in the Marion county court to enjoin him from asserting any claim to the oil inspection office. Felker brought a quo warranto proceeding in the county court to test the title to the office, alleging the act of 1901 under which Caldwell operated, to be unconstitutional. Felker's case was carried through to the supreme court and his contention was affirmed. The Caldwell case also was carried to the supreme court and an injunc-

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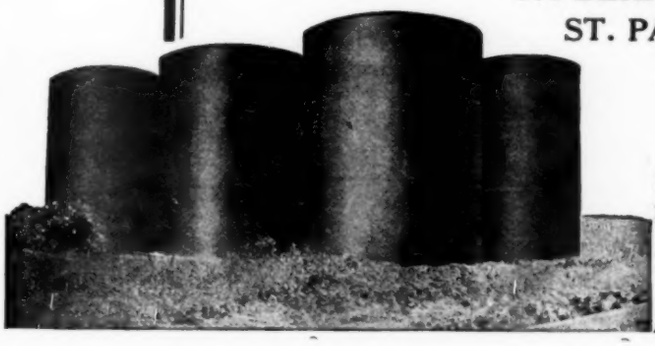

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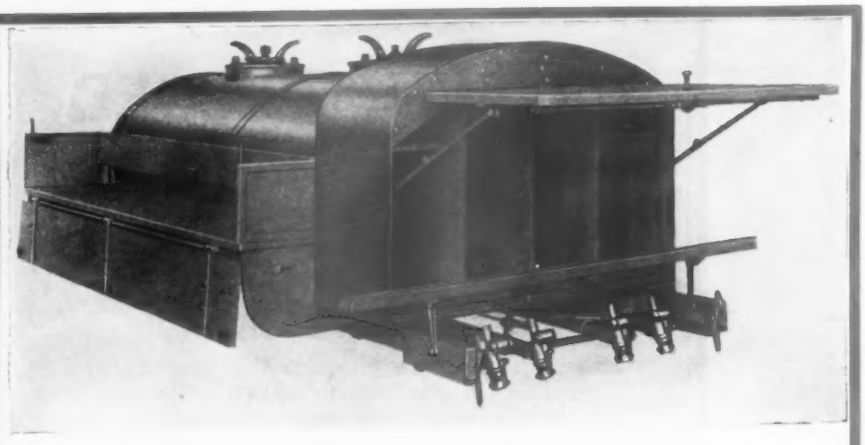

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tion against Felker was sustained, the court reversing itself.

In the decision just handed down, one of Caldwell's deputies, James R. Henry, is upheld in his plea for fees of $1,285 from the Standard Oil Co. Sixty-six other men who served as inspectors under Caldwell may now bring action to recover fees ranging from $1,200 to $2,100. Sixty-three deputies served under Felker and have claims ranging from $900 to $2,000, but their test case is pending in the supreme court.

Signal Hill Proven Oil Field? Is Tax Puzzle

By Special Correspondent

LOS ANGELES, Feb 24.—The question as to whether Signal Hill, Long Beach, which is being extensively exploited for oil, is a proven oil field is one that is bothering the county assessor at this time. The question must be answered on March 1.

The oil men can not answer the question for him, because they are divided on the question according to the direction in which their interests lie. The stock selling concerns would answer with a whoop that it is a proven field, and well proven at that, but some operators who so far failed to get profitable production and are still trying to do so at considerable expense, will no doubt contend that the field is only in the prospective stage. On the answer to the question will depend a difference in assessed valuation which may run into the millions.

A careful survey, made by the publicity manager of the Long Beach Chamber of Commerce, shows that nearly $6,000,000 has already been invested in the search for oil on Signal Hill. Here are a few of the items taken from his report: Amount paid Long Beach property owners on leases estimated at more than $1,000,000; 73 completed derricks $500,000; machinery, $1,750,000; casing now in wells, $750,000; boilers and outside connections and piping, $950,000; payroll of three shifts daily on each well, $183,750 a month; payroll for teamsters, office help and employes other than those actually engaged in drilling operations, $165,000 a month; each well while drilling, $35 a day for fuel, and electrical equipment, $68,000.

Rex Company Sales Under New Manager

PITTSBURGH, Feb. 24.—The Lucey Manufacturing Corp., with headquarters here, announces that F. E. Bernsen has been appointed general sales manager of the Rex Machinery & Supply Co., the headquarters of which are in Tulsa, with branches throughout the Oklahoma fields. This company is the distributer of Lucey products in that territory.

According to the announcement, Mr. Bernsen, right after the war, became interested in the oil industry and joined the forces of the Rex soon after its incorporation. He has since been very active in the Oklahoma fields, making his headquarters at Ardmore.

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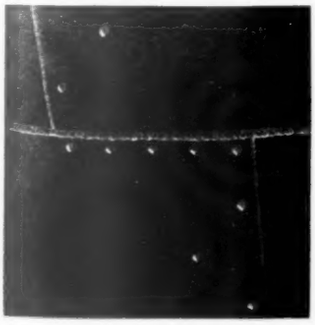

Girth seams single riveted, and electric lap welded. Longitudinal or vertical seams *extra* wide lapping, double riveted and electric lap welded, assuring leak proof seams, and additional bracing.

Haven't you often worried about the bulk tank you ordered being damaged in transit or while unloading? Ten to one you have, and it has worried tank manufacturers, too. So we solved the problem. The Leader "Rivet-Weld" is the result. Will it stand the gaff? The above picture illustrates an accident that happened just outside of Rockford, Ill. A Leader tank dropped 10 feet and never leaked a drop. No need for you to worry about a tank that will stand this.

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Riveting the plates together provides the necessary strength to take care of the stresses and strains.

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We are applying the method to all of our storage tanks ranging in capacity from 6,000 to 25,000 gallons. Both in underground and above ground, either plain or with Underwriter's approval.

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Burmah Hits Water In Sinai Peninsula Test

By Special Correspondent

WASHINGTON, Feb. 25.—The annual meeting of the British Burmah Petroleum Co., Ltd., held Jan. 24, according to Consul General Robert P. Skinner, London dealt with new concessions, particularly those covering 43 square miles in Egypt and the Peninsula of Sinai. On the Sinai concession the work is being actively proceeded with. The first well drilled to test the Matulla area has not met with success, according to the chairman. At something over 1200 feet it encountered waterlogged sand and it is probable that it will be decided to change the location of a second well.

While the oil possibilities of Egypt and Sinai are of great interest, the chairman said that at present he looked with confidence for more assured and early success in the Argentine Republic. With respect to this region he made the following statement:

"There in the Comodoro Rivadavia field, which bids fair to become one of the more important oil fields of the world, the Eastern Petroleum & Finance Co., in association with this company, has an option over any six or seven blocks, covering 16,500 acres. Already on the Comodoro field, besides the Argentine government itself, companies associated with the Anglo-Persian, the Royal Dutch and the Argentine Railways are drilling, and the Astra company, with a rate of production not far short of 10,500 barrels a day. And the record is remarkable—of the 140 wells drilled on the field only 15 have failed to strike oil. Their average production enables substantial profits; but there is always, besides, the chance of big wells, similar to that recently brought in on the government reserve, with an initial rate of flow of 21,000 barrels in 24 hours.

"Our own blocks, picked out of many that we could have obtained, are admirably placed and distributed. Those on the northern portion of the field adjoin the Astra property, and to the immediate south of our boundary several very productive wells have been brought in. Our western blocks are about three miles distant from the well quite lately brought into production by the Anglo-Persian interests. It was upon the recommendation of Campbell Hunter, who is closely associated with the work on the field, that we took up these options, and he has visited them again on our behalf to advise upon their development. The orders for plant have been placed and its delivery arranged for, and we hope to see drilling commenced within another six or seven months."

LOS ANGELES, Feb. 23.—The Union Oil Co. of California, whose headquarters are in this city, is negotiating for the purchase of three acres of land on the edge of Livingston, Fresno county, on which to erect a distributing station.

KANSAS CITY, Feb. 24.—The United States Cast Iron Pipe & Foundry Co. has opened a new office in the Interstate building here with D. W. Pratt in charge as sales agent.

You can locate prospective buyers for your leases by inserting an advertisement in the Oil Industry Exchange, near the back cover of this issue.

Curtis sign of heavy steel, furnished at small cost to users of Curtis Air Compressors.

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Stabilization Of Industry Here Vital To Filling Demand In Future

By Ralph Arnold

In opening the symposium on foreign oil possibilities, Dr. Ralph Arnold, chairman of the petroleum and gas committees, American institute of Mining and Metallurgical Engineers, brought to the front the several diverse, but related, questions before the meeting. In so doing, Dr. Arnold mentioned the appearance of water in the remaining Mexican pools of consequence, a report originally published in these columns and which was a subject of controversy for a time.—Editor.

IT is a source of great satisfaction to many of us here that, after a campaign of several years' duration on the part of a group of economic geologists and engineers, or scientific pessimists or so-called experts, or whatever you may be inclined to call them (depending largely on your command the the English language), the American oil industry has been awakened to a realization that the crude oil resources of the United States are not inexhaustible; that our crude oil should not be wasted but should be conserved, and used only for those purposes for which it alone is adapted; that every energy should be bent to improve our methods of refining, so that greater and greater percentages of gasoline, lubricants and other more desirable and valuable compounds may be made from the crude oil, rather than dissipated as fuel; and that, as some of the most conservative of the operators have even admitted there is a possibility in the dim distant future that we may have to resort to our oil shales as a source of supply.

No less a person that Tom O'Donnell has said most of these very things in public at the recent sessions of the American Petroleum Institute in Chicago, and Harry Sinclair at the same meeting admitted we needed a foreign supply and just wondered if the industry was willing to pay the price necessary to get it. It is therefore, no longer lese majesty in oildom to warn of our waning resources and call attention to the need of a foreign supply. In this connection, do you know, I have come to the definite conclusion that there is only a very, very slight difference between the so-called scientific expert and the so-called practical oil man, when it comes to drawing conclusions about the future oil resources of our country, and that that difference is merely one of time. Both the scientist and the practical oil man reach exactly the same conclusion and say exactly the same things on the subject—except the scientists say it about seven years in advance of the operator.

With reference to the appraisal of the foreign oil supply, it was first the intention to cover the whole world, but data relating to some of the European and Asiatic fields were so meagre it was finally decided to confine the discussion to the Americas and such other countries as are directly contributory to the United States. The data in some instances are fairly complete and for these countries the estimates should be reasonably dependable. In some others, the available information is meagre and the predictions, therefore, less reliable. In all cases the estimates are to be taken as progress reports, rather than final statements.

Working Together Abroad

The second item of discussion on our list, namely, the furtherance of the movement to bring about active cooperation among American companies operating in foreign fields, will probably take the form of suggestions, oft repeated in the past, but brought more forcibly to the companies themselves by the recent debacle in Mexico, the direct result of cut-throat competition between American companies in that field. Favorable action along these lines of co-operation is now a reality in at least one case.

One of the principal handicaps under which Americans operate in negotiating for oil concessions and leases in foreign countries is the excessive bonuses and royalties exacted by our government from operators on government and Indian lands. It is true that in most instances the extremely high bonuses of thousands of dollars per acre, and the excessive royalties amounting to as high as 55 per cent of the gross production, relate to leases on proven highly productive land. But foreigners are not prone to differentiate between proven and prospective land, and hence use these high figures as arguments in favor of impossible terms and conditions in their own cases. Right here I should like to venture the guess that in most instances where these excessive bonuses and royalties are paid, only a trifling profit, if any, is made by the operator.

It was my good fortune to help prepare the first draft of the leasing bill, several years before such a bill finally became law, and in these early drafts no effort was made to reserve the lion's share of the profit to the government, as in the present law. In order to bring this question to a head with congress, I would suggest a modification of the present law so as to make the maximum royalty 10 per cent, and abolishing any but nominal bonuses. The hazards of the oil business are great enough without the government "taking the last pound of flesh," and the benefit that would accrue to our nationals in foreign fields by reason of reduced royalties and bonuses at home would far outweigh the immediate loss to the government through the adoption of such a policy.

Co-operation between the state and commerce departments is closer than it has been at any time during the past, thanks to the men at the head of these two departments. There is still much to acomplish along the lines of settling matters of contention between domestic companies before they enter the foreign fields, so that whenever an American company or companies go abroad they will do so with a solid front to the parties with whom they are to deal. A strengthening of our consular agency and commercial attache systems would do much to help our foreign oil activities. Information regarding possibilities in new countries or the activities of foreign business rivals in any field is most valuable in advancing our own interests in these countries.

I wish to preface my remarks regarding price-fixing in the oil industry with the statement that I am not an advocate of the public ownership of utilities or of government interference or control in indusrty except in extreme cases. Anything that tends to cripple individual initiative usually hurts the business in which the individual is engaged and sooner or later reflects on the public. The man who said "More business in politics and less politics in business" voiced a wise sentiment.

Approves Imports Argument

Walter Teagle has endeavored to show by statistics that the foreign imports of oil (meaning Mexican oil) have little effect on the price of our light domestic crude. Mr. Teagle's case is greatly weakened by the fact that the price-fixers knocked 70 per cent from the price of Mid-Continent crude when the great glut of Mexican oil loomed last winter as a menace to our domestic industry but began raising the price again immediately it dawned on the fixers that most of the proven Mexican fields were doomed to speedy exhaustion. This erratic manipulation of the price caused the ruination of many small operators and Independents with a corresponding advantage to the stronger oil companies. In other words many of our American Independent operators and companies were sacrificed on the altar erected by the few producers and importers of Mexican oil. Let us take the most charitable view of the case and assume that the price manipulation was done as a result of panic rather than premeditatedly.

Favors Import Duty

In order to prevent a repetition of this catastrophe Congress should bestow upon the President the power to impose a sufficient import duty upon oil to protect the domestic industry from disaster when foreign importations appear menacing. By this I am not suggesting an import duty on oil to harass those companies who are far-seeing enough and courageous enough to enter the foreign fields but rather to prevent the dumping which has caused most of our troubles these last few months. Arguments of the exponents of cheap oil and cheap gasoline may be anticipated by saying that anything, such as these drastic cuts in price, which tend to unstabilize the industry, later only assures a higher price to the consumer and a

small profit or actual loss to the producer.

The power wielded by the group of men who fix the price of crude oil in this country is tremendous. I think I am disclosing no secrets of the oil fraternity when I state that they sometimes become the "inexorable law of supply and demand" when it suits their purpose. There is also a great responsibility to the rank and file of the producers and consumers and to the general public, if you please, which goes with this power. I, for one, am glad that this power rests in the hands of responsible and tried business men familiar with the vicissitudes as well as with the joys of their industry, rather than in the hands of irresponsible and inexperienced theorists. As long as these business men use this power with justice and discretion nothing should be done to interfere with them, but when they force through as unjustifiably drastic a cut in the price of crude oil as was done last winter, steps should be taken to curb their ability to wreak havoc on the industry.

I would not place the responsibility for all of our price depressions on this price-fixing group, by any means. Oftimes the producers, large and small, are to blame because of their refusal to adopt programs curbing drilling activities. Furthermore our present lease system with its off-set well requirements and compulsory drilling clauses is a curse to the sane development of many fields. But I do want to suggest to the price-fixing group of our industry in the most friendly way that in the future they cease using "cave-man tactics" and use more discretion, conservatism and magnanimity in regulating the price of crude oil so that they may have the confidence of the industry, the government and the people. Geologists and engineers through scientific study have become the great factor of conservation in the finding and development of the oil fields; why not apply some of their methods to the price-fixing end of the business.

In closing, just a word as to Mexico, lest the oil operators there think I am prejudiced against that great field—which I am not. And in this connection I hope you will discount the rumor that there is collusion between Mr. Edward Lawrence Doheny and myself in advertising the wonders (and blunders) of the Mexican fields. The mere fact that Mr. Doheny spent quite some little time in his recent speech before the American Petroleum Institute in Chicago in extolling my virtues as an ultra-conservative geologist, especially as regards estimates of future production in Mexico, does not mean collusion but is simply another proof that we folks out in Los Angeles never let an opportunity go by to boost for each other as well as for our unsurpassed climate and other natural advantages.

Water in Last Pools

Again referring to Mexico, may we not say that the oil industry there is "between the devil and the deep blue sea"—meaning, of course, the tax problems on one side and salt water on the other. Unfortunately the predictions made from this platform just a year ago have proven all too true. All of the old pools along the Dos Bocas-Alamo magic arc, with the exception of Toteco-Cerro Azul, are producing only through the stripping process, and salt water has already made its appearance in Toteco-Cerro Azul. Outside two little spots within the Dos Bocas-Alamo belt; viz., at San Geronimo and Tierra Blanca, no wells of importance outside of the old proven pools have been brought in in the light oil belt of Mexico during the past year. San Geronimo is a little area between the extinct Dos Bocas and Tepetate pools and Tierra Blanca is a northward extension of the Alamo pool, lying between the latter and the extinct Potrero del Llano pool. Neither of these new additions under the most favorable circumstances can have more than a very temporary effect on the situation. Every new big well brought in just speeds up the finish; it is just one more bung hole in the barrel.

Only three companies are left in the mad race to empty the last of the important magic pools of the proven light oil field of Mexico. They are vying with each other to dump their cheap oil into our domestic market, an inexcusable economic waste and a terrible blow to the great oil industry of this country. With only 24 wild-cat wells going down outside the proven belt of Mexico in the search for new fields, and none of these at all certain of getting important results, what are we to expect of Mexico in the next few months? When will the crash come and what will be the extent of the damage?

Central America Too Little Known To Afford Estimate Of Possibilities

By Arthur H. Redfield

NEW YORK, Feb 23

IN ESTIMATING the unmined petroleum reserves of Central America it is not feasible to employ the usual methods that have been worked out in the oil fields of the United States. No producing wells have been brought in in all Central America. No drilling sections have been made public. It is accordingly necessary to fall back on a crude "barrels per square mile" estimate. The method chosen in this paper is a comparison of the structure of the foreign field of unknown reserves with that of some supposedly analogous North American field whose reserves have been estimated. This method makes no pretense at scientific accuracy; but furnishes a mere working basis for an estimate.

The discussion of the probable oil reserves may be confined to three major areas. The first of these includes central and northern Guatemala and portions of southern and northern British Honduras. The second comprises certain limited zones in northern and central Honduras. The third includes both the Caribbean and Pacific coastal zones of Costa Rica and Panama.

Guatemala and British Honduras

Both the petrographic character and the structure of the Cretaceous and Tertiary sediments of northern Guatemala is favorable to the occurrence of petroleum in commercial quantities. In these sediments two distinctly bituminous horizons occur, the Coban limestone in the Lower Cretaceous and bituminous limestones in the Upper Tertiary of El Peten. The numerous beds of relatively impervious marl and limestone would appear to insure a sufficient cover to retain the hydrocarbons that may have accumulated in the sandstones, conglomerates, or other porous beds.

The Lower and Middle Cretaceous sediments which occur in Guatemala between latitudes 15° 20′ and 16° 00′ N are not only strongly folded, but considerably faulted and fractured. In Alta Verapaz the Cretaceous plateau drops in a series of step-faults down to the plain of El Peten.

The Upper Tertiary marls and sandstones of southern Peten and southeastern British Honduras show very slight disturbance. The Cretaceous and Tertiary sediments of the northern part of El Peten, though likewise relatively flat-lying, give evidence of some folding. The relative positions of the Cretaceous and Tartiary in this department appear to indicate a series of broad, gentle folds curved in broad arcs convex to the south.

There is accordingly in northern Guatemala and certain adjacent portions of British Honduras a broad zone of moderately disturbed Cretaceous and Teritary sediments. Bituminous beds occur, associated with a due succession of porous and impervious strata. These are folded into broad anticlines and synclines with gentle dips. Faults are few and of slight displacement. No intrusions of late igneous rocks are known to occur. On the basis of our present knowledge of Central American geology, this appears to be the most favorable area for oil prospecting in Central America.

Likeness to Central Texas

The American field to which the Guatemala-British Honduras area presents the closest resemblance is the Cretaceous and Tertiary belt of central Texas, exclusive of the Gulf Coast oil fields. This comparison is based on certain analogies of stratigraphy and structure and on the geographic relations between the two areas. It must be accepted at the start, however, that the resemblances noted are by no means absolute.

The oldest stratified rocks of northern and central Guatemala consist of Mississippian and Pennsylvanian, against which Triassic and Cretaceous sediments are faulted down. The Tertiary series succeeds in apparent conformity. In central Texas the Pennsylvanian sediments are overlain unconformably on the east by Cretaceous, succeeded by Tertiary. In Guatemala a fault separates the Lower and the Middle Cretaceous. In central Texas the Balcones Fault runs through the Middle and Lower Cretaceous formations. In both areas a series of step-like faults lead down to the more or less gently dipping Tertiary sediments. In both areas the Cretaceous and Tertiary sediments are affected by small folds, which diminish in intensity toward the sea. In Texas, the folded Lower Tertiary gives way to the salt dome oil fields in the Upper Tertiary of the Gulf Coastal Plain. Oil fields occur on salt domes in the Upper Tertiary beds of the Isthmian zone of Mexico in which the

(Continued on page 48-D)

Canada's Hope For Oil Lies In Western Provinces, Not In Far North

NEW YORK, Feb. 23

By Ralph Arnold
and
Walter A. English

THOUGH production began in Canada only a short time after the discovery of oil in the United States, it has never attained large proportions, and if we were to judge entirely by past performance the reserves of Canada would be put at a very low figure.

There are only two areas from which oil is marketed at the present time; one, the old district around Petrolia in southern Ontario, and the other is the small Sheep Creek field near Calgary in Alberta. The former district has produced between 200,000 barrels and 800,000 barrels annually for the past 40 years, recent figures being near the minimum amount. Sheep Creek has produced about 12,000 barrels annually for the past five years. The known reserves in proved territory in each of these fields are exceedingly small, when considered in terms of world reserves.

The chief hope of Canada for reserves of considerable magnitude lies in the western provinces. Sedimentary rocks similar to those in the productive fields of the United States occupy many thousands of square miles in the western provinces, and it seems likely that somewhere within this great area the peculiar conditions necessary for the presence of oil pools will be found. Prospecting is being carried on energetically by several large companies, as well as by many Independents. The Dominion government, which controls most of the public land, is pursuing a fairly liberal policy towards the prospector, which should stimulate wildcatting, although the province of British Columbia, which controls public lands within that province, is at present unwilling to give adequate encouragement to make wildcatting attractive.

Since there is really no assurance that any productive pools will be found in western Canada, any estimate of reserves would be subject to a very wide possibility of error. In making the accompanying estimates the various areas within which geologic conditions are more or less uniform are discussed separately. The estimates given for each area are not given with the idea that there is any reasonable probability of their eventually proving to be correct. It is hoped that an average of these estimates taken together with those made for other undeveloped countries will give a correct total of reserves for all areas considered, even though the estimates are much too large in some cases and in others, too small.

Comparison to U. S. Fields

The estimates are made by comparing the Canadian areas to geologically similar districts in the United States where development has been sufficient to prove fairly definitely what the ultimate resources will be. It is assumed that the current estimates for total resources of each of the main producing areas of the United States are not greatly in error. With this as a basis, an attempt is made to arrive at a figure which represents the probable maximum production of each of the Canadian areas, in percentages of the whole, provided its production proves to be as great as the most similar area in the United States.

The estimates are made for the following geographic divisions:

1 Eastern Canada
2 Southeastern and central plains of Alberta and southwestern Saskatchewan.
3 Northern Plains of Alberta.
4 Rocky Mountain front of Alberta and British Columbia.
5 McKenzie river District.

1—Eastern Canada: The greater part of eastern Canada is occupied by the shield of pre-Cambrian rocks in which there is no chance of finding oil. In southern Ontario and Quebec are areas of nearly flat-lying paleozoic rocks from which oil has been produced on the southwestern tip of Ontario, in the Petrolia district. The rest of this area appears to be about as favorable geologically, except for the absence of seepages which characterize the Petrolia area. Prospecting, although extending over a long period of time, has been discouraging, except in the Petrolia district where a few small pools are discovered from time to time. An estimate of 300,000 barrels annually for 20 years seems fair for the Petrolia district, and four million barrels for the rest of the province, giving 10 million barrels as the reserves of eastern Canada.

2—Southern and central plains of Alberta. The prospective oil fields of the plains region of central and southeastern Alberta and southwestern Saskatchewan derive their supply from the basal Cretaceous beds, the southern extension of the big tar sands of the Athabasca on the north and the northern extension of the Montana oil-bearing beds on the south. The oil-bearing formations in the belt from Lower Slave Lake to southwestern Saskatchewan lie on the eastern flank of the great Edmonton syncline and are affected by several cross structures, including anticlines and domes, which are favorable for oil accumulations. The depth to the oil horizon varies from 2500 to 4000 feet. Three important commercial gas fields have been developed in the region in sands overlying the oil horizon. The areas of the possible and probable oil land are as follows:

Name	Possible Area	Probable Area
Birch Lake Sounding Creek	1500 sq.mi.	75 sq.mi.
Southwestern Alberta	360 sq.mi.	18 sq.mi.
Saskatchewan	720 sq.mi.	36 sq.mi.
	2580 sq.mi.	129 sq.mi.

The Tar Sands Area

3—Northern plains of Alberta: This includes the basin of low dipping Cretaceous rocks from the latitude of Edmonton northward. Outcrops are scarce, being practically confined to the banks of the principal rivers, and consequently the details of structure are not known. Dips vary from 5 to 20 feet per mile, and no areas of steeper local structure have been found. Thus far, most of the interest has centered around the tar sands of the Fort McMurray district. At this point, basal Cretaceous sands, which directly overlie a petroliferous Devonian limestone, are saturated with tar for a maximum thickness of 200 feet, and a linear extent along the Athabasca river of about 50 miles. This is the most extensive area of exposed tar sands in the world. Prospect wells have been drilled to reach these sands away from the outcrop but the same quality of tar has been encountered in all wells drilled to date. In between these points are large areas which have not to date been prospected, and productive fields may yet be found in these areas. Conditions may be compared to those in Illinois and possibly Ohio. The estimated possible and probable area is about the same as for the southern and central plains, this is possibly 2500 square miles, probably 130 square miles.

4—Rocky Mountain front of Alberta and British Columbia: This comprises a long strip along the edge of the Rocky Mountains, commonly called the disturbed belt of Cretaceous. It varies in width from five to 20 miles. The rocks are similar lithologically to the Cretaceous of Wyoming, but the structural conditions are different. There are no separate ranges of pre-Cretaceous rocks with intervening Cretaceous basins, around the edges of which are found dome structures, as in the case of Wyoming. The Canadian mountain front is a continuous, nearly straight line, and the folds in the Cretaceous are almost exactly parallel to the mountain front. The anticlines are long and narrow and have steep beds along the crest, which is usually faulted. The Sheep Creek field near Calgary is one of the best appearing structures, and tests have proven only a very small production.

The only oil seepages known along the mountain front are in the Sheep Creek field. In British Columbia, south of Peace river, apparently more favorable structures have been recently discovered, but they have not yet been thoroughly investigated because of the remoteness, and the lack of cooperation of the British Columbia government.

5—McKenzie River district: Much prominence has been recently given to the far north of western Canada because of the completion near Fort Norman of a flowing well. This well, which was drilled by the Imperial Oil Co., is said to have flowed at the rate of more than 1000 barrels per day for periods of less than an hour. After only a small amount of oil had been produced, the capacity of the well greatly declined. The well is located on the flank of a large anticline where the dip is about 10 degrees. The productive horizon is eroded from the crest of the fold, and it out-crops less than a mile from the well. At the present time this reserve is not commercially available and it is possible that it will never become commercially feasible to bring the oil from this district to the world's markets.

Approximate percentages of the petroleum estimated to come from the various areas is as follows: (millions of barrels 000 omitted)

Eastern Canada	.4
S. E. and central plains of Alberta and s. w. Saskatchewan	45.
Northern plains of Alberta	45.
Rocky Mountain front of Alberta and British Columbia	.8
McKenzie river district	8.6

Central America

(Continued from page 48B)

geologic formations of Guatemala are continued to the west.

The area of the department of El Peten is about 13,200 square miles. To this may be added 1,000 square miles for parts of British Honduras which may be presumed to present a favorable structure, and 2,300 square miles for the less disturbed parts of the departments of Huehuetenango, El Quiche, Alta Verapaz, and Izabal. This gives a total area of 16,500 square miles.

Estimate of Reserves

By ratio of areas assuming the same relative oil content for the Cretaceous and Tertiary of Guatemala and British Honduras as for the Central Texas, we may accordingly estimate the unmined petroleum reserves of the Guatemala-British Honduras area at a maximum of 38 million barrels. Certain reservations would be wise, however. The Cretaceous of Texas has been demonstrated to be productive, notably at Corsicana, Thrall, and at Mexia. The Cretaceous and Tertiary of Guatemala have yet to be proved. The geology of central Texas is known from numerous reports of the U. S. Geological Survey and of the state geological survey as well as through oil company records. That of northern Guatemala and British Honduras is known almost entirely from the reconnaissances of a single geologist, Dr. Karl Sapper. Only at one point is the thickness of the Cretaceous of Guatemala known; the thickness of the Tertiary and of the possible oil-bearing horizons in either Cretaceous or Tertiary are entirely unknown. The continuity of the possible oil-bearing horizons is by no means established. The reported oil seepages may be derived from local pools of limited extent. Moreover, about one-third of this area is faulted to a marked degree. Accordingly the estimate for the Guatemala-British Honduras area may be reduced to about 25 million barrels. This again is purely an arithmetical calculation by ratio. It is smaller than the U. S. Geological Survey estimates for any region of the United States except the Atlantic and eastern Gulf coastal plains.

Honduras

The only well authenticated seepages in Honduras issue from the Metapan strata. These consist chiefly of clays, red marls, sandstones, and conglomerates, with interbedded limestones. Fossils found in these rocks place their age as Lower Cretaceous. They are conformably overlain by a moderate thickness of Middle Cretaceous limestones.

Good evidence exists for assuming the petroliferous character of the Metapan strata. Well-authenticated seepages occur in this formation in the Guare Mountains of the department of Cortes and gilsonite exposures in the vicinity of Juticalpa.

The zones of Cretaceous sediments in northern and central Honduras are narrow, broken, and of limited extent. The close folding, faulting, and igneous intrusion to which they have been subjected makes it unlikely that oil pools of any considerable extent should occur. Anticlinal structures have been noted in only a few places on the geologic profiles made by Sapper. Oil pools of limited extent may indeed occur on fault-sealed monoclines or in shattered zones; but sufficient knowledge of local geology is not available to predicate any estimate of this basis. No effort will be made in this paper to estimate the oil reserves of Honduras, which from all the evidence presented are of negligible extent in comparison with the unmined reserves in any one of the minor regions of the United States.

Costa Rica and Panama

The Tertiary sediments of Costa Rica and Panama belong to the Oligocene and Miocene. Eocene sediments have been noted in only one restricted area of the Azuero Peninsula of Panama. Pliocene formations are restricted chiefly to the upraised coral reefs which occur at intervals along the coast.

The Tertiary of Costa Rica and Panama consists of shales, many of which are carbonaceous, interbedded with sandstones and conglomerates, with a few limestone beds. Outside of the Canal Zone, the corelation of the various members is not sufficiently definite to permit at this time any more definite subdivision.

The petroliferous character of these Tertiary sediments is fairly well established. Well authenticated oil seepages occur in the basin of Sixaola River and asphalt seepages occur along Mosquito Gulf in Panama. Other seepages are reported to occur locally along the Pacific Coast of both Costa Rica and Panama.

In general, the zones of Tertiary sediments on both the Caribbean and the Pacific coasts of Costa Rica and Panama are relatively narrow in extent. From their close proximity to the granite ranges which apparently underlie the late igneous flows of the central cordillera, one may postulate the close folding and steep dips, which have been observed in fact in the Sixaola basin and in Bocas del Toro Province, Panama. Considerable faulting has occurred; and igneous intrusions have been noted.

Three areas of the coastal Tertiary of Costa Rica and Panama may be selected for discussion as the most favorable. The first includes the basins of Rio Estrella and Rio Sixaola in the so-called Talamanca district of southeastern Costa Rica and the coastal Tertiary zone of the adjacent Province of Bocas del Toro, Panama. The second or South Darien district comprises the basins of the rivers which empty into the North and South Bays of the Gulf of San Miguel, on the Pacific coast of the Province of Panama. A third area of interest lies in the Azuero Peninsula in the Provinces of Herrera, Los Santos, and Veraguas.

The Talamanca-Bocas del Toro district occupies an approximate area of 3,300 square miles. Oil seeps along fault lines in shattered dark shales which form the lowest member of the Tertiary. These shales are overlain unconformably by interbedded sandstones and shales, and these in turn unconformably by conglomerates.

The late Miocene thrusts were exerted in lines normal to the present mountain trends of the Isthmus, and these have resulted in the formation of folds striking about N 55°-60° W in southeastern Costa Rica, and NW-SE in Bocas del Toro Province, Panama. The districts nearest to the central cordillera show steeply-dipping strata, closely folded, highly shattered and faulted, with numerous dikes and other igneous intrusions. The intensity of the folding diminishes toward the Caribbean coast.

The South Darien district comprises a geosynclinal basin of Tertiary sediments in the Province of Panama in the drainage basins of Rio Tuyra and Rio Savannah, and similar Tertiary basins south of San Miguel Bay and in the lower basin of Rio Chepo. These geosynclines are wrinkled into minor folds which strike parallel to the trend of the central cordillera.

The formations exposed in these basins are, Lower Tertiary sandstones, marls, and limestones. Well attested seepages occur about San Miguel Gulf. The structure shows anticlinal folds which trend generally NW-SE. In spite of the proximity of mountain ranges of late eruptive effusive rocks, no intrusions of igneous rocks have been noted.

The area of the South Darien district may be roughly estimated at 1,200 square miles.

On the Azuero Peninsula, Lower Tertiary sediments occupy a zone which averages 30 miles in width and approximates 1500 square miles in area, from east to west across the northern half of the peninsula and portions of the adjacent mainland. These consist chiefly of sandstones, shales, clays, breccias, and conglomerates with intercalated lignite seams. These sediments are folded into a series of anticlines and synclines which strike about N 85° E. Local faults may occur. Seepages apparently from these formations are said to occur around Montijo Bay.

No Basis for Estimate

No oil field of the United States offers a very close analogy to the geologic conditions of the Costa Rica-Panama area. In the marked unconformities, close folding, and considerable faulting, the oil fields of southern California offer a resemblance. Late igneous intrusions, however, play no part in the southern California oil fields as in the coastal areas of Costa Rica and Panama. The California fields probably do not occur in such close proximity to a cordillera of late igneous rocks. The sediments of the California valleys occupy a wider area and are more continuous than those of the coastal plains and foothills of Costa Rica and Panama.

Accordingly, no satisfactory basis exists for an estimate of the oil reserves of the Costa Rica-Panama area. There are in all probability reserves of unmined petroleum in this territory. But on the basis of the known geology of the district it is fairly safe to assume that they will hardly be comparable with those of any one of the oil fields of the United States.

LOS ANGELES, Feb. 23.—After catching afire a second time through friction, being snuffed out by a charge of dynamite, later again starting into a blaze that lasted for four days, the gas well of the Union Oil Co. of California at Santa Fe Springs once more is silent ,the gas closed in and the flame extinguished by the hole being filled up to the top with sand. The latter day discharge created a crater almost as great in diameter as that on the Alexander No. 1 a few weeks ago.

LOS ANGELES, Feb. 23.—The town of Fillmore, Ventura county, is to be supplied with natural gas. The fuel will be piped a distance of two and a half miles from the South Mountain fields and delivered from the Wilkins well at Bardsdale. The supply will be 1,200,000 cubic feet a day, sufficient for the entire community. The Southern Counties Gas Co. is installing the distributing plant.

West Indies May Be Considered To Hold Little Deposits Of Oil

By Arthur H. Redfield

NEW YORK, Feb. 23

THE West Indies are the summits of a submerged mountain chain, of which the continuation must be sought in the mountains of central Honduras. In Haiti the chain divides, one branch passing through Jamaica and the other through Cuba, the Cayman Islands, and Misteriosa bank.

Suess divides the West Indies into three zones: (1) The first or inner zone of volcanic rocks; (2) the second or Great Antillean zone, which consists chiefly of Cretaceous and Tertiary rocks; and (3) the outermost zone of Miocene and later beds.

Oil-bearing Areas

The volcanic islands of the inner arc of the Lesser Antilles may be excluded from consideration at the start. These include Saba, St. Kitts, Nevis, Redonda, Montserrat, the western half of Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, the Grenadines, and Grenada.

The low lying islands of the outer arc may likewise be excluded because of their structure. They are composed essentially of flat-lying Upper Tertiary beds in which there are no indications of the presence of oil. To this group belong the Bahamas, Anegada, Sombrero, and Barbuda.

The prospective oil fields of the West Indies all lie in the second or Great Antillean arc. The structure of these islands is generally anticlinal, though modified to a greater or less extent by faulting and by igneous intrusion. Of the islands of this group Cuba, Haiti-San Domingo, Barbados offer the greatest promise of oil reserves.

In Porto Rico the structure of the island is not favorable for the presence of oil fields. A broad zone of the crystaline complex occupies the center of the island. Tertiary and Quaternary sediments occupy coastal areas of relatively minor extent.

The structure of Jamaica is likewise unpromising. Folded Cretaceous sediments form the nucleus of the Blue Mountains, which extend in the eastern end of the island in a northwest-southeast direction paraller to the northeast coast. Similar folded Cretaceous rocks occur in the center of the island in the Clarendon and Jerusalem ranges. These mountain ranges are surrounded by a dissected plateau of more or less horizontal Oligocene limestones, which cover four-fifths of the island. Both the folded Cretaceous of the mountain ranges and the horizontal Oligocene limestones are intruded over a large part of the island by late igneous rocks. These have produced considerable alteration in the sediments.

Seepages Reported

Asphalt seeps and veins, or oil and gas seeps have been reported from every province in Cuba. They are most common on the north coast, especially in a zone about 20 miles wide between Esperanza and the boundary of Santa Clara province. They extend 475 miles. Most of the oil or asphalt seepages occur in fractured serpentine. De Golyer believes the oil was derived from the Jurassic limestone or other sedimentary rocks; that the igneous rocks from which the serpentines were derived were intruded for the most part into Cretaceous rocks that overlie the Jurassic; and that the seepages found in the serpentine originate in the underlying sediments or in patches of sedimentary rock caught up in the serpentine. It is believed by others, however, that the Cretaceous beds are unconformable with some of the serpentine bodies, and that the oil has accumulated near the unconformity.

Obviously, no serious attempt can be made to estimate the unmined petroleum reserves of Cuba until the geologic questions as to its origin and mode of occurrence are settled. No well that has been drilled to date in Cuba has passed through the serpentine in which the seepages occur, so that the underlying structure is a matter of conjecture. Without more exact knowledge of the geologic occurrence of the oil, neither the extent of the oil-bearing formations nor their average content can be satisfactorily estimated.

Development Hazards Great

De Golyer, who has made a close study of the petroleum geology of Cuba, believes that oil still remains in the island, but that the prospects of developing a great oil field are not good, and that the hazards of prospecting are more than the average. No more definite estimate of the reserves of Cuba can be made on the basis of our present knowledge.

Haiti-San Domingo

The most promising area in Haiti and Santo Domingo from the standpoint of petroleum production lies in the central structural depression of the island. This includes the Central Plain of Haiti, and the Valley of San Juan and the Azua Plain of the Dominican Republic. This depression is a geosyncline, modified by secondary synclinal and anticlinal folds. The axis of the geosyncline and of its secondary folds is northwest-southeast, parallel to the structural trend of the mountains which enclose it. In Santo Domingo the synclinal basin is partly outlined on the north by a fault.

The oil-bearing horizon in the Azua Plain of Santo Domingo is a Mioene series of conglomerate, coarse sandstone and sandy shale. In Haiti the most promising formation is considered to be the Thomonde formation (Lower Miocene of shales, sandstones, conglomerates, and limestones. Well authenticated reports of seepages issue from the Miocene beds of the Azua Plain. Reports of seepages in the Thomonde formation of Haiti have not been confirmed.

The area of the central plain of Haiti may be roughly calculated at 850 square miles. The area of the valley of San Juan may be estimated at 1050 square miles and of the plain of Azua at 1350 square miles. The total area of the central depression of the island may accordingly be placed at 3250 square miles.

The minor folds with which the geosynclinal central plain of Haiti is modified include a marked anticlinal dome, a compound anticline upon which three minor, asymmetric, anticlines are superimposed, and a plunging asymmetric anticline.

The San Juan valley of Santo Domingo is so largely covered with Pliocene gravel that the folded beds beneath can be studied at only a few places. The section exposed along Rio Yaqui del Sur, near the east end of the valley, shows almost entirely coarse sandy materials that offer no promise of containing petroleum.

In the Azua plain the presence of an elongated dome, which trends nearly north-south, is suggested near Higuerito. To the southeast the beds are greatly crumpled and faulted. West of Heguerito details of the structure are not satisfactorily known.

In general, too little is known of the detailed structure of the central depression of the island to hazard a quantative estimate of the petroleum it contains. Apparently favorable structures occur in the Haitian or northwest end of the depression. In Santo Domingo the petroliferous character of the formations is attested by seepages and by a short-lived production obtained by the drill. This area, of all the prospective West Indian oil fields, appears on the face of the evidence to be the most deserving of further examination by the geologist.

Barbados

Six-sevenths of the island of Barbados is occupied by coral limestones which apparently at one time capped the whole island. The denudation of these limestones in the east portion of the island has exposed the "Scotland series" (Lower Tertiary?) of sandstones and shales. These are overlain unconformably by about 300 feet of the "Oceanic series" (Miocene) earths and clay deposits.

The "Scotland series" forms the core of the island. It is closely folded into a series of anticlines and synclines striking mostly E NE—W SW. The folds in some places are overturned for short distances. The folds are broken by numerous faults, some of which are vertical and some of which dip at angles of 13 to 15 degrees.

The "Oceanic series" (Miocene) rests uncomformably on the eroded and upturned edges of the "Scotland series." The "Oceanic series" is unconformably overlain in turn by the Pliocene (?) or Pleistocene coral limestone which caps the island.

The structure of Barbados is complicated and the details are little known. The strata of the "Scotland series" are closely folded, considerably faulted, and much shattered. The area of Barbados is only 166 square miles, and the horizontal cover of limestone makes it impossible to ascertain how much of this limited area is underlain by the "Scotland series." In view of all these circumstances, the petroleum reserves of Barbados may be considered to be insignificant in relation to the world situation.

The West Indies (exclusive of Trinidad and Tobago) do not in general constitute a very promising area for

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Development In Venezuela Should Be Figured As Highly Expensive

By Ralph Arnold
and
Barnabas Bryan

NEW YORK, Feb. 23

WHILE a great deal of geological work and considerable drilling have been done in Venezuela, the incompleteness of geological evidence obtainable and the restricted areas where drilling has been done make any estimates of oil resources extremely speculative. Nevertheless it is felt that this paper and the figures given are justified in the belief that the ideas of a geologist familiar with the region are better than those of a promoter.

The oldest beds of interest to oil men are those of the Cretaceous which are well developed in eastern Venezuela and about parts of Lake Maracaibo. In both cases a hard, massive limestone is overlaid by a great thickness, most of which is shale. In the west this shale is in places more than 2000 feet thick, while in the east it may attain 3500 feet. The limestone and parts of the shale are oil producing.

In the east the Tertiary where present is almost entirely covered by the Quaternary, but in the west it is very well developed.

In probable unconformity over the Cretaceous shales is found a series of sandstones and shales, which may be called the lower coal series. It is well developed southwest of the lake where it is the oil container. It is probably the lowest series exposed east of the lake.

Above this is the Pauji shale which is probably the point of origin of all the oil east of Lake Maracaibo and in the state of Falcon. It has a thickness of about 3000 feet in the Mene Grande region.

The upper coal series is developed as a great thickness of sands, shales and clays, with some partly consolidated limestone. Its thickness may be as great as 10,000 feet. It is the oil container of the Falcon El Mene region and a probable location for oil in some of the area about the lake. It may or may not include the so-called Maracaibo series in which the oil is found at Mene Grande.

Over much of Venezuela, the Quaternary is present in unknown thickness, which is probably not great. It obscures oil structure in all cases and presents the greatest hazard of oil exploration for the fields which probably exist below. It is at once a promise and a threat.

Relative Importance of Regions

From the standpoint of oil production at a profit, the Lake Maracaibo region contains over 95 per cent of the probabilities of Venezuela. Here the combined action of the major mountain ranges pinched the intervening area to produce the geo-syncline of the lake and the surrounding wrinkles which contain the oil possibilities.

In the accompanying map, those areas shown in black have through drilling shown some production in what would be commercial quantities if located in the United States. The double hatched area includes that part of the region which has the greatest potentiality for new discoveries and wherein some new fields will be found. That hatched down to the east includes the area where further exploration and carefully considered drilling may be justified, but regarding which no great optimism should be entertained. The area hatched down to the west is that where there is some slight possibility of oil in non-commercial quantities, but where the present expenditure of development or exploration money is not justified. In the area left blank there are no oil possibilities. unjustified.

In eastern Venezuela the possibilities are entirely based on geology with only negative evidence from the drill. While work in the region has been done with great care and forethought, the most encouraging results have been the discovery of semi-liquid asphalt of no present commercial value. Nevertheless, the evidence of oil ore so pronounced and the region of incomplete surface evidence is so large that the authors have no hesitancy in saying that oil will eventually be discovered by the drill in commercial quantities.

In the region south of the mountains, there are evidences of oil and the probability of structure, but the difficulties of transportation and the numerous troubles and costs necessary to development of oil will prevent these fields from being able to produce oil at a profit for many years to come.

Cost of Development

Such an estimate of possible oil to be produced from Venezuela would be grossly misleading without some estimate of what that oil will cost per barrel. A number of people are today tampering with fire by attempting to make money in Venezuela without sufficient resources in land or money. Costs of development are truly enormous, while to achieve success the investment must be carried for many years before the profits will appear. The most sane companies have as yet failed to recover a gross return equal to their investment, after 10 years of development. Any work in Venezuela based on a return of less than $2.50 per barrel for the oil f. o. b. tanker is dangerous and probably

Trinidad

The oil of Trinidad is found in true sands in the lower part of the Tertiary series, which is well developed in the southern half of the island. The structure is mostly anticlinal, although a few domes have developed oil.

Nine fields have been developed by about 500 wells, about 200 of which are approximately 3000 feet deep. One of these fields produces oil of about 40° Baume while the remainder give a lower grade running from 14 to 22° Baume. The developed area is about five square miles or 3200 acres which will produce about 6250 barrels per acre. Thus the total production of the known fields will be about 20 million barrels.

The total production fromTrinidad in 1920 was 12 million barrels thus leaving the probable production from the developed fields at about eight million barrels. Possible increases in the probable production of known fields may somewhat increase these totals while other developments in the southern half of the island are of course possible, but such possibilities are very indefinite at present.

Due to the presence of igneous and metamorphic rocks, and the absence of the oil forming series of Venezuela and that of the southern half of the continent, the Guianas may be eliminated from serious consideration for oil without fear of any substantial error. The the only possibilities are in the swamp area along the coast, where geological evidence is lacking.

Personal Observations

With full knowledge that many men will take exception to their statements, it may be stated that in the future, less and less oil will be imported into the United States. We agree with the estimates of the "probable" oil reserves of the United States, but it is known that these estimates do not include "possible" oil reserves as distinguished from probable oil reserves. Certainly there will be discoveries which will add to reserves in the future as they have in the past. As regards South America. it is the writer's opinion that many of us are gazing into a mirage.

After visiting a large percentage of the prospective territory of that continent and having some experience with the costs and difficulties of development, the writers agree that 10 cents spent in increasing the percentage recovery of oil from known American fields will be more productive of profits than a dollar spent in the tropics and that new methods of recovery will double our probable reserves. It is likewise the writers' opinion that shale oils produced in the United States can be laid down in the great markets from Chicago and St. Louis westward at less cost per barrel than oil produced from sand storage fields in the tropics.

West Indies

(Continued from page 48E)

future oil reserves. By far the most of the islands present unfavorable structures or composition. The smaller islands, with the exception of Barbados, are composed either of late eruptive rocks or of flat-lying Upper Tertiary sediments. Of the Greater Antilles, only Cuba and Haiti-San Domingo appear to have the proper geologic structure for the accumulation of commercial pools of oil.

Any efforts to estimate quantitatively the petroleum reserves of these islands is unsatisfactory for lack of the data upon which to proceed. Details of the local geology are largely lacking. The area in which the oil may be expected to occur is difficult to determine. No satisfactory analogies may be drawn between the West Indian oil fields and those of the United States, whereby the possible reserves of the former may be inferred from the calculated reserves of the latter. Any attempt at a quantitative estimate is accordingly futile. On the basis of the known data, however, the total unmined reserves of the West Indies may be set down as small in comparison with those of any one of the oil fields of the United States.

Peru Far Below Production That Might Be Developed

By V. F Marsters

THE republic of Peru has been a producer of petroleum since the early seventies. The appearance of this industry as an actual commercial enterprise, was first brought about by Senor De Faustino Piaggo, a business man of Callo, Peru. This work was started in what is now known as the Zorritos field, located in the Province of Tumbes, adjoining Ecuador on the south.

In the early nineties, the Negritos field came into some prominence. This is located in The Department of Piura. By 1905 the annual production of the Negritos area was approximately 335,-160 barrels. The early development of this field was under the general direction of the London and Pacific Petroleum Co., but today is handled by the International Petroleum Co. and subsidiaries.

In 1900 and 1901, the Lobitos Field became the scene of increased activity in prospecting for oil. In 1905, the total annual production amounted to 75,000 barrels and has continued to increase to the present date. The same is true of Negritos field.

From 1897 to 1902 some extended prospecting was carried on in the region of La Briota (or Fernandez). This place is located on the Mancora river some twenty-five to thirty kilometers from the coast. Small production of a heavy oil was obtained from three different sands. So far as I am aware, no work has been done in that locality since 1902. We thus have four distinct fields in the north end of the Peruvian Coastal Plain.

The remaining producing locality of Peru is situated at the northwest end of Lake Titicaca, Department of Puno, in the south part of Peru. This field may be reached from Mollendo, the main south sea-port of the Republic, by Railway to Juliaca. The field of this locality is known as the Pirin or Pusi. The first actual prospecting done here was executed by the Brown Brothers of Los Angeles, California. Modest production was obtained about 1906. According to reports, activities ceased about 1914 or 1915. The maximum annual production was obtained about 1908, estimated to be about 96,000 barrels.

A glance at the map of Peru, therefore shows that the Republic possesses two distinct geographic provinces in which we may look for the development of a much larger oil industry, than exists to-day. These provinces are:

1. The coastal plain province.
2. Inter-Andean plains.

North Coastal Plain

1. Zorritos Field:—The most northern producing area is known as the Zorritos field. Drilling has been carried on along the coast line for a distance of some ten kilometers and approximately three kilometers to the interior. Approximately 90 per cent of the drilling is confined to the shore-line.

The northeast of the Zorritos field exploration for oil deposits was conducted by a French company in Quebrada Heath, but no commercial results were obtained, although oil sands were reported to have been encountered.

It may be frankly stated here that favorable structural conditions may be easily detected in parts of the Zorritos field; but it can also be said that some of the prospecting done in this region as a whole, does not seem to have been guided by geological and structural conditions.

As regards the details of developement, it has to be admitted that the late work, that is, wells drilled, details concerning production, etc., is not known in full by the writer. However, we have some of the facts at hand. At the end of 1915, 313 wells had been drilled in this field and 116 had been productive. There are three main producing sands in the field varying in depth from 194 to 1640 feet. The deepest well drilled, so far as I am aware reached 3020 feet. It was drilled in 1915.

At the close of 1918, the Zorritos field is reported to have put out an annual total production of 76,190 barrels. Its maximum production was reached in 1910 when 107,000 barrels were obtained.

Lobitos Oil Field

Like the Zorritos field, the greater part of the present productive area is located near the shore-line, but production is obtained further to the interior, than in the Zorritos field.

Favorable structural conditions can be detected very easily at various points not only in the immediate so far developed, but in sections across the entire concession, as known to the writer when making investigations of this region in the interests of the Peruvian government. Their early prospecting evidently was done without reference to geological and structural conditions, hence the failures of the early tests made in this field.

In 1917 the Lobitos field had obtained some 143 producing wells. Four producing sands are known in this field between 400 and 2500 feet. So far as I am aware the deepest well drilled reached a depth of 3435 feet. The total annual production in 1918 was estimated at 639,098 barrels.

Negritos Oil Field

The Negritos field is located to the southwest of the Lobitos and some 10 to 12 kilometers to the south of Talara, the shipping port of this particular sections. This field is located on the largest single concession granted by the Peruvian government. It is also the largest producing field of the republic. The first wells obtained here were located to close the shore-line as at Zorritos. Exploration soon extended to the northeast towards Talara and likewise to the interior. This general region possesses a number of structures.

At the beginning of 1918, the Negritos area had possessed a total of 695 producing wells. The wells of the Lagunitas area, a block of ground developed by a subsidiary company to the International, are included in the above list.

Not less than seven distinct oil sands are known. These range in depth from 300 to 3000 feet.

The deepest well drilled in the field was sunk to 3900 feet. From what I have learned concerning this test, it would seem, that the drill was still in Tertiary sediments at the above depth.

The commercial character of the petroleum from the above fields is as follows:

Gasoline	15% to 25%
Kerosene	20% to 24%
Lubricating oils	20% to 30%
Asphaltic base	

After the Lake Titicaca Oil Co. closed operations, their holdings were acquired by the "Sociedad de Petroleos Espana" who drilled some 12 wells and cleaned out the old ones. Of the ten wells drilled by the Lake Titicaca Oil Co. five were productive. The first ten wells were drilled from 193 to 815 feet. the production was obtained between 242 and 750 feet.

The wells drilled by the Sociedad de Petroleos Espana, twelve in number, ranged in depth from 170 to 420 feet in depth and obtained a little production from 193 to 249 feet. The sand ranged from 4 to 13 feet in thickness.

Perin or Pusi Field

The remaining producing area is located in the south part of the republic in the Department of Puno. It may be reached by rail from the port of Mollendo. The nearest railway point to the field is Juliaca, the Junction point between the Railway Line from the coast and the Puno-Cuzco line. The oil field is some 25 to 30 kilometers northeast from Juliaca.

According to the published statistics, this field became productive about 1906, but activities ceased about 1915.

Some ten wells had been drilled when I visited this locality. The deepest well was drilled to 1500 feet. The producing sands were found between 250 and 700 feet.

The petroleum of the Pusi field is reported to show the following contents:

Gasoline	0 to 7%
Kerosene	7 to 20%
Lubricating oils, main part of the product. Parafine base.	

The total annual production of Peru in 1920 was estimated to be 2,790,000 barrels.

Oil Seepages

In the south part of the republic of Peru, seepages are known to exist in many directions from the Perin or Pusi field. In the department of Puno such have been recognized near Hauncane, to the east of Perin; to the northwest in the region of Yaraviri; and to the west near Lampa and Marravillas.

It may be stated here that much of the area between these points, as well as far to the northwest, is occupied by

Tertiary and Cretaceous formations. While no detailed geological information concerning this section, more aptly designated as a part of the inter-Andean plain, has been published, personal investigations lead to the belief that these formations extend across a part of the Department of Cuzco and thence into the Department of Apurimac. This I consider eligible ground for investigation, assuming that the demand for increased production of crude oil, continues.

Seepages are likewise known to the southwest near Dasaguadero and on the border between Peru and Bolivia. Similar occurrences are reported to exist to the southwest and within the limits of the high plains of Bolivia and in the following Departments: Apurimac; Cuzco; Avacucho; Junin and Huanuco.

Seepages on East Slope

For some time past we have been hearing of oil seeps on the east slope of the Andes, somewhere in the vicinity of Yarimaguas, or according to the official map of Peru, about on the border of the Department of San Martin with Deparmtent of Loreto, or on the Haullage river. From such information as I have been able to collect, I believe there exists in this general section a belt, or lowland adjacent to the foothills, composed of Tertiary and probably a much larger group of Cretaceous sediments, which should prove to be well worth investigation, with the growth of international interest in the oil industry.

Total **promising** acreage outside of the actual areas considered as proven and partially developed ..... (Coastal plain province)	540,000
Total possible producing acreage of the coastal plain province of Per...u.....	2,579,915

Lake Titicaca Region

Producing and semi-proven area of the Pusi Perin field, approximately	9,880
Possible producing area at the northwest end of Lake Titicaca, plains and slopes between Juliaca and Huancane	98,800
Of the total **possible** producing area of the coastal plain of Peru about one-third may be regarded as probable and two thirds or **possible producing** acreage of the coast of Peru.....	1,719,942
Probable producing acreage of the coast of Peru.....	859,971

With a total annual production of more than 3,000,000 barrels for 1921, it is believed that a vigorous drilling campaign on the coastal plain alone of Peru could bring up the total annual production to 9,000,000 barrels at the period of peak production.

In my opinion Peru, today, is far below its possible maximum annual production; this of course, in part, depends upon the extent of increased activity, in new territory. In the last five years drilling has been confined to practically proven ground. The fact that the Peruvian government has removed a portion of the coastal plain from denouncement and placed it on the reserved list, is in part responsible for the lack of increased activity in new localities.

Peruvian production

Total production of Peru from 1896 to 1921.....30,176,355 bbls.
Total production for 1920 2,790,000 bbls.
Total production for 1921 3,568,000. bbls.
Increase in total production for 1921 ..... 778,000 bbls.

Assuming an increasingly active drilling campaign not only on the known extensions of producing structures, but also on other coastal areas where probable to favorable conditions are believed to exist it is estimated that not less than six years will be required to prove the areal extent of productive territory, on the entire coast.

Using the above increment of increase (placed at 770,000) per annum, Peru should be producing some 9,180,000 barrels by the close of 1928.

This is regarded as the peak of production for the Peruvian coast. The total production of the Peruvian coast line from 1921 to 1928 will figure at approximately 33,818,415 bbls.

Calculations on production on an acreage basis is expected to very materially increase the sum total production.

ECUADOR

In the Republic of Ecuador, the occurrence of seepages of oil have been known for many years. The locality first to receive attention and being worked at the present moment in a modest way, lies on the north shore of the Sta. Slena peninsula, or between La Puntilla and Salinas. Operations are being carried on by local parties. These occurrence attracted the attention of foreign companies, some of whom have made extensive investigations, acquired some large blocks of acreage and have already done some considerable drilling. For details concerning present drilling activities in Ecuador, we are indebted to Mr. Leon Price, an American resident engineer of Ecuador. The information solicited, came to me thru the office of the American Consulate, with permission to use same at this conference.

Comparatively late investigations of the south coast have revealed many seepages, most of these so far known being near the inner edge of the coastal plain, between Zarumilla and Santa Rosa and also between Santa Rosa and Machala. In the latter region are many low places or basins, usually partly filled with water. At times these pools show oil films on the surface. I am also informed that there are a few places between Machala and Nevasa where seepages are known. It is also reported that seepages are known on Puno Island.

North of Guayaquil in the basin of the Guayas (or Duale) river, seepages are recognized at Petrillo and near Duale; also to the west of Guayaquil near Chongon. These are mentioned by Price and others.

In the interior and to the east of Quito seepages are known in the vicinity of Banos. Mention should also be made of seepages on the coast line at or near Manglas Alto. These are mentioned by Price and Cardon and have been mentioned in reports that have come to my notice.

Concerning present operations in Ecuador, I quote the statements of Mr. Price.

Anglo-Euratoriano Oil Fields Co., Ltd. was organized in 1919 to take over the holdings of the Lobitos Oil Co. in Eucador, and in fact is a subsidiary of that company. Their property includes approximately 129,000 acres in the region of Ayangue, located about thirty kilometers northeast of Sta. Elena. On this block the company has drilled one test to 1600 feet. Drilling activities were closed about July 1921.

This company likewise holds some 35,000 acres in the vicinity of Ancon located some twelve kilometers south of Sta. Elena. A well was drilled on the block about two kilometers east of the village, but is now practically abandoned although it is capable of producing a few barrels of oil per day. Well No. 2 of this company is located one mile east of No. 1. It was drilled to 2800 feet. It produced about 40 barrels per day. Well No. 3 is being drilled about one mile northeast from No. 2.

British Controlled Oilfields Co., Ltd., has optional holdings on approximately 80,000 acres located inland some 15 kilometers from Punta Centinella. The company drilled some three wells. Two of these are located near the shore line, and were drilled to depths of 700 and 2000 feet respectively and both showing oil. A third well was drilled near Volcancite about 25 kilometers east from Sta. Elena, the depth of which is unknown. The company closed its operations in Ecuador in December 1921 and moved their activities to Venezuela.

International Petroleum Co., Ltd., (of Canada) is drilling a well near the town of Manta, which last August had reached a depth of 1500 ft. with no indications of oil. Under the old law this company denounced a block of 1000 acres and also bought a number of claims scattered over the Sta. Elena and Ancon regions. They are producing no oil.

Sackay & Harmsworth Exploration Co., controls about 20,000 acres on the Sta. Elena peninsula on the extreme western portion, the producing property lying to the northwest of Sta. Elena. This company has three wells each about 700 feet deep. They also have a number of open pits which produce a considerable quantity of seepage oil. The oil produced from the wells average about 45 degrees Baume, while that from the pits ranges from 20 to 40 degrees. The company also purchased a small refinery at Salitvo, a small place in the neighborhood. The production is sold at Guayaquil and is sufficient in quantity to somewhat interfere with imports of that community.

Local petroleum interests have a number of hand-dug pits south from Salinas, about 40,000 barrels being the annual output. This production is refined at the Carolina Refinery. Another Guayaquil Syndicate is drilling a well on its property near Ancon. High officials on the republic are interested in this project.

Leonard Exploration Co., has been merged recently into the Andes Corp. of New York. This organization has been granted a concession in El Oriente of 20,000 square kilometers. This huge block is divided into two zones, one be-

ing around the village of Canelas, and the other further north along the Cofanes and San Miguel rivers. Under its contract, the company paid a deposit of 5000,000 sucres and is to build roads through the cordilleras to their properties. A telephone line is likewise in course of construction.

Amazon Corp., Ltd., of Canada has been granted a large concession in El Oriente, also divided into two zones. The total acreage is not known. It is in the neighborhood of the concessions granted to the Leonard Exploration Co. In lieu of the concessions, this company agrees to enter into the construction of railways on a large scale.

Summary of Conclusions

To date we have no reliable information upon which to make any calculations on the possible to probable and favorable oil-bearing territory east of the East Andean Range. Nevertheless, we are assured of the occurrence of oil seepages in the vicinity of Yurimaugas, which according to the official map of Ecuador lies on or near the boundary between Peru and Ecuador. This place is located on the Haullaga river, and as I understand from information received from different sources, must be on the edge of east Andean range, or near the junction of the interior fluviatile plains with the Andean foot-hills. We have reason to believe that Cretaceous and probably Tertiary sediments exist in this eastern province. With geological conditions similar not only to the coastal province, but duplicating in part what is reported in the Argentine and Bolivia, I see no reason why we should not expect to find oil deposits of commercial importance in the Oriente provinces of Ecuador and Peru.

Production

As a matter of fact, Ecuador possesses but one well producing at the present moment. This is the property of the Anglo-Ecuatoriana (or Ancon Co,.). It is located near Ancon on the south coast of the Sta. Elena peninsula It was drilled to 2800 feet. It has produced from 37 to 40 barrels per day.

The three wells drilled by the Sakay and Harmsworth Co. west of Santa Elena are reported to have been drilled to about 700 feet. These are reported to have been producing wells, but it is my understanding that they are temporarily abandoned. The main production of Ecuador is being obtained from open pit mining near Sta. Elena.

Assuming that the extent of favorable, probable and possible territory, corresponds in a general way, at least, to the coastal plain province, as recognized on the border of Peru to the south, we have evident reasons to believe that the Republic of Ecuador may possess oil-bearing territory of even greater area than Peru.

As to the possibilities of the interior provinces, we do not have, at the present moment, enough details upon which to base a definited statement, but we must admit that the surface indications referred to, favor the view that careful investigations of this entire interior province both in Peru and Ecuador, bid fair to yield very important and far-reaching results.

Brazil Is Territory Untested And Little Known Geologically

By Dr. John C. Branner
Stanford University, California

FIVE of the geologic horizons that yield oil in other parts of the world are represented in Brazil, namely: Devonian, Carboniferous, Permian, Cretaceous, and Tertiary. Of these the first two have thus far shown no evidences of being oil bearing within Brazilian territory, and may, for the present be passed by.

Not enough exploration has been done in Brazil to enable one to make trustworthy comparisons of the relative importance of the Permian, Cretaceous, and Tertiary as oil bearing horizons in that country. The most important, and indeed almost the only information available, relates to the locations of the areas and to the structural features of the several horizons. The theories regarding the physical conditions under which these rocks were laid down, I regard, however, of the utmost importance.

Permian.—Rocks of Permian age cover an enormous area in Brazil, extending from the southernmost state of Rio Grande do Sul to Maranhao on the north, and to Matto Grosso on the west. These Permian rocks in many places are known to include oil-bearing shales, and in some locations they contain small veins of gilsonite. The Permian area is very widely distributed, but unfortunately there is considerable doubt about the origin of some of these rocks. Some of the lower Permian beds in southern Brazil contain marine fossils, but further north in Minas no fossils have as yet been found in them, and from Bahia, at only one locality, only have a few Permian plants been found.

Indications of oil have been found in the state of Sao Paulo, Parana, and elsewhere further south, and wells have been drilled in the Permian of Sao Paulo near the Morro do Bofete, but without finding oil. One well has been started by the Brazilian government in the Permian of the state of Parana near Marechal Mallet close to latitude 26° S., but thus far without favorable results.

Cretaceous.—Rocks of Cretaceous age are found in many Brazilian states, but while some of them are certainly of marine origin, others seem to be land and fresh water deposits. Those best known are the marine beds in the states of Sergipe and Bahia, where they are all more or less folded, and exhibit what petroleum geologists consider favorable structure. In some places, especially at Marahu in Bahia marine Cretaceous beds are acccompanied and overlain by oil bearing shales. It is quite probable that the Cretaceous rocks are more widespread than the geologic map suggests, for it may be that the Tertiary beds where they form rather wide zones along the coast, have Cretaceous rocks beneath them. This is inferred from the fact that at a few places posed on the sea shore, while to the we know of the Tertiary being well exlandward the Cretaceous is the surface rock. This is shown at both Parahyba and about the island of Ithamaraca just north of Pernambuco. At Bahia the map shows a considerable area of Cretaceous rocks extending northward to the Rio S. Francisco. The Cretaceous age of these Bahia beds has been determined beyond question for the region about the bay of Bahia, but there is more or less doubt about whether the same horizon continues to the Rio S. Francisco. The rocks in this zone are folded, some of them standing at an angle of 45 degrees or even more, and there are many evidences of faulting. The rocks of this particular belt, so far as they are exposed, are shales and sandstones. In the state of Sergipe some of the Cretaceous beds are highly fossiliferous limestones of marine origin, and it is quite probable that these Cretaceous rocks extend into the southwestern corner of the state of Alagoas, where they are overlain by the Tertiary sediments.

Also in the state of Maranhao the Cretaceous seems to underlie a large area in the eastern part of the coastal belt.

I know of no test wells having been drilled in the Cretaceous rocks in any part of Brazil. There has been more or less talk about such wells, and it is quite possible that some have been sunk; but if so, it is assumed that they were unsuccessful, for the results have not been reported.

Tertiary.—The chief Tertiary area of Brazil is that lying along the eastern base of the Andes and covering almost all of the Acre territory and the greater part of the state of Amazonas, and forming broad belts across the state of Para on both sides of the Amazon river. This area becomes a narrow and patchy one along the rest of the east coast of Brazil from Maranhao at the north to Rio de Janeiro on the south. In some places these coastal Tertiary beds are known to have Cretaceous rocks beneath them, but for the most part they rest upon Archean granites and gneisses. They are folded in some places, but for the most part, they are nearly horizontal. The rocks are sandstones, shales, and conglomerates, and are profoundly weathered and highly colored where they are exposed along streams and on seashores. They sometimes contain marine or brackish water fossils, and the shales are often petroliferous. Here and there through the interior are freshwater deposits of Tertiary age, evidently laid down in lakes. The rocks of these freshwater deposits are usually shales containing the remains of freshwater fishes, and plant impressions, and yielding considerable oil upon distillation.

Beginning with the less important of of these areas, the freshwater deposits contain bituminous shales that have been utilized somewhat for the manufacture of gas at Taubate in the state of Sao Paulo, but I understand that they are no longer used. The areas covered by these freshwater deposits are probably too small to hold out any reasonable promise of their yielding petroleum.

The broken and irregular coastal belt that extends with interruptions from Cape Frio, near Rio de Janeiro, to Maranhao and beyond, has been much in the public eye for many years as a possible source of oil. It seems quite possible that where this zone widens out here and there, and extends well into the interior, as it does at Bahia for 300 miles, at Mossoro in the state of Rio Grande do Norte, and at Maranhao, it may contain petroleum. But elsewhere along

that entire distance my personal acquaintance with the geology of the zone leads me to regard it with grave doubts because as a whole it is too narrow, too fragmentary and too thin to furnish collecting grounds for much petroleum.

Turning to the great Tertiary area of the upper Amazon region, we are certainly not limited for room, for within Brazilian territory alone the Tertiary in Acre and Amazonas covers more than a million square kilometers. The thickness of these deposits, except along the margins, is quite unknown. At many places they contain beds of lignite. Regarding this great area as an oil field we have but little more than opinions and theories to offer. In 1908, Dr. I. C. White surmised that if large deposits of petroleum were ever found in Brazil they would "be located in the territory drained by the great 'Amozan'". But Dr. White did not say why he thought so. In 1920, Dr. Horace E. Williams of the Geological Survey of Brazil ,and one of my own students, said that this same region "and the Peruvian frontier seem to be the most promising field for explorations of any in the country." What these opinions are based upon I am not sure that I know, but I presume that it is inferred that the oil regions known to exist in Argentina, Bolivia, Venezuela and Colombia are probably more or less continuous along the eastern base of the Andes and across western Brazil. For my own part I am disposed to attach considerable importance to the fact that fossils found along the western frontier of that Tertiary region are brackish water formations that probably mark the period following the elevation of the Andes. It seems probable also that the drainage of the upper Amazon region formerly flowed westward into the Pacific, and consequently that the sediments would accumulate toward the western end of the area drained. When the mountains rose only the brackish water forms of life survived for a while.

It is to be regretted that this upper Amazon region is not better known and is not a more attractive country in which to live. The greater part of Brazil is healthful, but unfortunately this cannot be said of the western part of the forest covered region of the state of Amazonas.

I know of only one attempt to drill an oil well in the Tertiary area of Brazil and this was made in the state of Rio de Janeiro near Campos. It is said to have reached a depth of thirty meters (98.4 feet) without results.

In connection with this subject of the petroleum possibilities of Brazil, attention should be called to the great extent of the areas of which the geology of Brazil is entirely unknown, amounting to more than a million square kilometers. What promise these unexplored areas may hold out to the petroleum geologist it is, as yet, quite impossible to predict.

Philippine Islands May Be Classed As Possible Oil Bearing Territory

By Wallace E. Pratt

THE PHILIPPINE Islands have produced no oil commercially in the past. Nevertheless, oil is known beyond question to be present in some quantity at various places over the Islands.

While it is true that all attempts to produce oil commercially have failed up to date, it must also be admitted that no intelligent, persistant exploration has as yet been carried out.

The Richmond Petroleum Corp. (reported to be a subsidiary of the Standard Oil Co. of California) is the one exception to this statement. It is at present engaged in exploring Bondoc Peninsula, Tayabas Province, one of the promising Philippine areas, in a manner which promises adequate and intelligent testing of the petroleum possibilities.

The Philippines must, therefore, be classed as possible petroleum-bearing territory, the reserves of which this symposium desire to consider.

How can the petroleum resources of an entirely undeveloped area like the Philippines be estimated? Not even the areal extent of the various geologic formations is known precisely. Obviously no calculated figure for assured future production can be arrived at. But a study of the evidence of the occurence of petroleum, the character of the possible reservoir beds and the probable source rocks, the character and size of favorable structures, and the area over which petroleum-bearing rocks are known to occur will throw some light on the question, while the facts that rocks of the same geologic age and similar composition have been explored and are producing in Borneo, Sumatra, and Java to the south and in Formosa and Japan north of the Philippines can also be brought to bear on the problem. Altogether, one can obtain some idea of the order of magnitude of the quantity of petroleum that may reasonably be expected from the Philippines. It is this measure of the possibilities rather than a definite calculation of petroleum reserves in the Philippines that is presented herewith.

This paper will not attempt to describe nor even to enumerate in detail the occurrences of petroleum in the Philippines, such data having already been recorded elsewhere.

The Philippine Archipelago comprises some 3000 islands with an aggregate area of 115,000 square miles, 90 per cent of which is included in the following ten larger islands: Luzon, Mindanao, Mindoro, Samar, Leyte, Masbate, Cebu, Negros, Panay, and Palawan. The Philippines lie about 800 miles off the eastern coast of China and, together with the Jananese Islands to the north and the Dutch East Indies to the south—with both of which groups the Philippines are related geologically, they mark the extreme eastern margin of the Asiatic continental area. Immediately eastward and just off the continental shelf are the most profound deeps of the Pacific Ocean while westward between the islands and the mainland the sea is everywhere shallow, submerging low portions of the continent proper.

Oil Seepages Numerous

On all the larger Philippine Islands except Palawan there are definite evidences of the presence of oil; Luzon, Leyte, Cebu, Mindanao and Panay afford oil seepages; on Mindoro and Samar inflamable gas is encountered; while on Masbate and Negros the same Tertiary (Miocene?) shales which yield oil through seepages elsewhere, are found and their petroliferous character persists in these islands. Probably the same shales are present in Palawan also, but little geologic exploration has been carried out on this island. The petroliferous shale series is of adequate thickness (3000 feet or more) and of suitable character to supply commercial quantities of petroleum. Intercalated with the shale beds are sandstones which would serve as reservoir rocks. At various places the geologic structure is known to be such as to tend to effect accumulations of oil in these sandstones. Seepages at the surface in regions of favorable structure indicate that accumulation has indeed taken place there.

The foregoing facts support the idea that the Philippines contain possible resources of petroleum. Other and more convincing evidence, perhaps, is to be found in the commercial exploitation of petroleum from rocks of the same geologic age and very similar character in Formosa and Japan to the north, and Borneo, Sumatra, and Java to the south of the Philippines.

The popular conception of the Philippines as a group of volcanic islands obscures the fact that a fair proportion of their area consists of sedimentary rocks, not severely broken nor folded nor otherwise impossible as retainers of substances such as petroleum. Luzon and Mindanao, the two conspicuously large islands lying one at either end of the group, each contains some thousands of square miles of sedimentary rocks while the Visayan Islands occupying a central position in the Archipelago are even more largely of sedimentary origin. Samar, for example, with an area of from five to six thousand square miles consists almost exclusively of sedimentary rocks; altogether in the Visayan Islands there are probably 12,000 square miles of fairly flat lying sedimentary beds. A large proportion of the sedimentary area everywhere, perhaps as much as 50 per cent, includes with other Tertiary formations, the petroliferous shale series in which oil seepages occur. Throughout the Philippines these oil-bearing rocks may be estimated to be present over a probable total area of from 10,000 to 15,000 square miles.

Estimate of Known Area

The area over which actual seepages of oil are known is very much less impressive, however. On Bondoc Penninsula in Tayabas Province, Luzon, where there are a half dozen good seepages of light oil ,the showings are scattered over an area of about 300 square miles. In the northeastern part of Leyte in the vicinity of the town of Villaba there are oil seeps and asphalt (or paraffine) beds at places over about 150 square miles. On the east coast of Cebu are two seepages, some 30 miles apart but it is doubtful if all the intervening area is similarly petroliferous. Other isolated seeps occur in Mindanao and in Panay, and it is probably fair on the whole to estimate the known area of petroleum-bearing rocks in the Philippines at 500 square miles.

The 300 square miles of known petroleum-bearing rocks on Bondoc Peninsula have been surveyed in a reconnaissance way and several lines of sharp anticlinal folding are mapped, along which the largest seepages are found. Thus, some half dozen small sharp anticlines are known which might be expected to produce, if they produce at all, over an area a quarter mile wide and from one to three miles long. If it be assumed that one such field develops from the six known anticlines, a productive area of 500 acres might fairly be expected. Since there will probably be

(Continued on page 48L Col. 3)

Colombia's Possible Oil Fields Extend Over Enormous Territory

By Chester W. Washburne
and
K. D. White

COLOMBIA is one of the two most northern of the countries of South America stituated as it is between the equator and 12° north latitude. The position is ideal with respect to the world's markets. The short distance from the Panama canal, the proximity of the West Indies, and the sailing distance to New York, from its Caribbean ports less than from Tampico, gives it a very strategic position.

During the last few years the country has awakened widespread interest in regards to its petroleum possibilities which has been followed by active leasing and drilling.

Geographically Colombia consists of three systems of mountain ranges with large valleys separating each system. The Cauca River valley separates the western or coastal range from the central. On the western side of the coastal range are the Atrato and San Juan Rivers. The central and eastern ranges are separated by the Magdalena River valley. In the department of Santander the eastern range divides, one branch forming the cordillera of Perija, the other the cordillera of Merida in Venezuela. Between these ranges is the great basin occupied by Lake Maracaibo.

These valleys or topographic basins are great re-entrants or tongues of sediments which are separated from each other by the mountain ranges. Though late Miocene and younger sediments seem to have been deposited in separated basins, Cretaceous and possibly some earlier Tertiary strata were laid down more or less continuous over a great part of Colombia and Venezuela. These strata were subsequently folded into the present ranges. However, though the deposition was in a great sea, with the main land-mass in Brazil and probably with land along some of the cores of the present mountain systems. The character and thickness of the sediments except the Lower Cretaceous very markedly. An illustration is seen in the massive series of conglomerates of the Upper Magdalena River Valley, Honda region, which are almost wholly wanting in the coastal sections of that period of goelogic time.

Oil From Cretaceous

The oldest rocks that are important in the search for oil are the black carbonaceous and bituminous shales, limestones and charts of the upper part of the Lower Cretaceous. These probably are the source of the oil in both Colombia and Venezuela. Above the carbonaceous and bituminous beds, are a series of many thousand feet of clastic sediments. The most noticeable and easily recognizable formation of the clastic sediments is the "coal-bearing series." The horizons that have been proven to be productive of petroleum in Colombia, are in this series and in the next overlying formation.

For comparison Colombia may be roughly subdivided in the following areas or districts:

1. The Santa Marta area and the Goajira Peninsular.
2. The Sinu River valley.
3. The Cartegena-Barranquilla Coastal region.
4. The Lower Magdalena River valley.
5. The Upper Magdalena River valley.
6. The Amazon River drainage or the Meta River basin.
7. The Colombian-Venezuelan area.
8. The Pacific Coastal plain.
9. The Atrato River valley.

Sinu River Valley

The sediments of this valley are of Miocene and Pliocene age. They have been sharply folded and in localities faulted. Sharp flextured anticlines with limbs dipping 45° or more near the crest are the rule rather than the exception.

Elfred Beck described several structures that he located east and north of the Sinu River, the most important of which was the Sincelejo anticline which he traced for more than fifty miles the axis bearing a little east of north. The eastern flank of the anticline dips from 5° to 30° while the western limb dips at 45°. In Beck's cross-section the folding becomes sharper westward and considerable faulting is shown.

West of Sinu River, between Monteria and the sea three anticlines have been recognized and each traced about ten miles.

The two more eastern folds are separated by a syncline some ten miles wide between anticlinal axes. The anticlines are closely folded, the limbs towards the synclines have an average dip about 45° for a mile from their crests. The other limbs are nearly vertical. The petroleum evidence of both anticlines are similar. Large mud volcanoes and seepages of dark green oils come from their steeply dipping crests. The anticlines, the crests of which are in Miocene rocks expose seven or eight thousand feet of strata.

The third anticline is located on the sea coast probably in Pliocene rocks. It is similar in character and seepage evidence to the other two.

The petroleum evidence of the surface of this district consists of seepages of heavy pitchy oils, dark green oils, gas spring and mud volcanoes. Practically all oil and gas seepages are located either in the fractured core of closely folded anticlines or along fault planes.

Four wells have been drilled in the Sinu River valley and another is now being drilled by the South American Gulf Oil Co. at San Andres.

The first well was drilled by a Holland company between the years of 1910 to 1912 near San Sebastion, east of the Sinu River. It reached a depth of about 400 feet and encountered a dark green oil of a gravity about 36° Be. It was reported to have been a 50-barrel well. In 1915 it was badly mudded and would only pump a few barrels.

In 1915 and 1916 the Standard Oil Co. of New York drilled three wells to depths of about 2000 feet. The wells were located respectively, with reference to Lorica, 4 miles east, 8 miles northeast, and 12 miles northwest of the town.

These wells are all reported to have struck small shows of oil and gas.

Nothing has been definitely proven by these wells. All except the shallow well were drilled quite far down the flank of the structures on which they were located. The entire region is covered with thick deposits of sandstone and shale which are closely folded and much faulted. Any structure in this district deserves testing where the equavalent of the "coal-bearing" series of the Magdalena River Valley or strata close above it, may be reached by the drill, and where the rocks are not too badly shattered, and where the drainage area is not too limited. With the thick shale section of the later Tertiary and with the presence of numerous petroleum seepages, well developed folds in the Miocene and Pliocene rocks are also worthy of test, but it should be recognized that no oil horizons have been proven in these strata and that drilling to upper Tertiary horizons is much more speculative than drilling to Lower Tertiary and Upper Cretaceous horizons.

Cartegena-Barranquilla Coastal Region

This area roughly embraces the region between the Caribbean sea coast, the Magdalena River, and the Cartegena-Calmar railroad. In this territory practically as many wells have been drilled as in all the rest of Colombia.

About six miles southwest of Puerto Colombia at the village of Perdices, 7 wells had been drilled up to the beginning of 1918. These wells are all within a thousand feet of each other. An eighth well is located some 3 miles east of this locality. According to Beck the drilling was commenced by a Canadian company in 1907, and was continued in 1912 or 1913 by the Kelly Oil Co.

Of these eight wells, the deepest No. 6, Perdices was drilled to 3030 feet. This well encountered showing of oil and gas at various horizons. At 2443 to 2446 feet in a sandstone, 3,000,000 feet of gas was reported.

Well No. 1, Perdices, had the best showing. Salt water and oil, with a gravity of 32° Be. was reported at 135 feet, while in a broken sand and shale formation at 745-754 feet oil of 43.4 Be. that flowed natural and on the pump made 140 barrels in 7 hours, was reported. In 1917 the well was badly mudded but pumped about ½ barrel a day.

The other wells which were drilled to depths of 1600 feet or less encountered shows of oil and gas.

The Three Seas Oil Co. is now drilling a deep test in the Perdices region at no great distance from the other wells. Beck states that the drilling has been on a steep, narrow, poorly defined fold.

At Turbaco, a station on the Cartagena-Calmar railroad, the Martinez Oil Co. drilled five wells. Operations, according to Beck, were commenced in 1908. The first four wells were drilled with a keystone machine to a depth less than 500 feet respectively. They were all located close

together in the immediate vicinity of numerous and active mud volcanoes. These wells were drilled on the evidence of the mud volcanoes, which had been given prominence by their description by Von Humboldt, the great German explorer of the early Nineteenth century.

Later, another location was made about a mile south of the mud volcanoes. For this location the Martinez Oil Co. brought in a standard rig. According to Beck, the drilling commenced in 1912. The well was drilled to a depth of about 2200 feet. The log shows a remarkable uniformity with very few changes. This is readily explained by an excavation 500 feet east of the location where strata striking N 40° dip westward from 75° to vertical.

The surface petroleum evidence of this district is large and active mud volcanoes, gas springs and seepages of dark green oil.

None of the drilling, so far, it appears, has been on large well formed structures, so that the territory is not to be questioned by the results. The testing of any well developed, moderate structure, seems to be amply justified.

Lower Magdalena Valley

This is one of the two areas that have been proven to contain commercial oil deposits. The fold which is about 300 miles from the mouth of the Magdalena River, and 20 to 25 miles eastward, up the Colorado River, had its discovery well drilled in April, 1918, by the Tropical Oil Co. The first two wells drilled were abandoned at about 600 feet, great difficulty being encountered with caving. The drilling operations were commenced in 1916. The company was purchased in 1920 by the Standard Oil Co. of New Jersey, which has built a railroad from Barranca Bermeja to the field and has shipped in large supplies of pipe, casing, tools, etc., preparatory to extensive developments.

North of the Tropical Oil Co.'s property on the Lebrija River, the Colombian Syndicate has drilled several wells, all of which had oil showings, but none of which produced appreciable amounts.

At Zambrano, which is about 125 miles from the mouth of the Magdalena River, the Granada Oil Co. drilled a test well, now reported as a dry hole. The well is not in any sense a sufficient test of the region.

In this region are large deposits of asphalt or brea, active seepages of dark green oil, gas springs and veins of devolatilized asphaltum varying from gilsonite to grahamite. Here the large deposits of asphalt and hydrocarbon veins are restricted to the east side of the valley.

In the Lebrija River region the first rocks seen going east from the Magdalena River dip westward. On the west side of the Magdalena River the rocks dip eastward, suggesting that the Magdalena River Valley in this district is a synclinal basin.

With the proven presence of commercial oil, and the establishment of transportation of oil from the district to the markets practically certain, any structure should be tested that is not too contorted if the coal bearing series or strata just above it be reached under suitable cover.

Upper Magdalena Valley

This territory may be taken as the region above La Dorada which is the end of navigation of the lower Magdalena River. This subdivision contains the Honda district which of late has been the scene of considerable leasing activity and of some drilling.

The region has numerous small anticlines. Its major structure consists of great block-faults. The throw of some of the faults is many thousands of feet. There are two lines of seepages, one at the west foot of the second range of the Eastern Andes and the other at the east foot of the Central Andes. Generalizing, the seepages below Guataqui are almost entirely of heavy asphaltic oil or brea, while most of those above Guataqui are of a dark green grade.

At the east base of the central Andes the structure in the older sedimentary rocks, in many places, is concealed by overlap of Tertiary formations, though there are exceptions to this as at Chaparral where there is a large deposit of brea associated with an anticline.

The seepages of the Eastern Andes are either coming from small folds or along fault-planes. They are located either near the top of the lower Cretaceous black shales and limestones or in beds a few hundred feet above.

Three wells have been drilled. In 1918 the Carib Syndicate drilled a 700 foot-hole about three miles southwest of the San Felipe Railroad Station. A little tarry oil was found in the bottom of the hole which stopped at the schists.

In 1921 the Transcontinental Oil Co. drilled some 15 miles southeast of Honda. The well is reported 3300 feet deep and was dry. Near Guataqui the same company is reported to have struck a flowing well.

The three wells producing in the Tropical Oil Co's. concession, and the one on the Barco concession indicate a certain amount of commercially proven and highly probable oil land. The present stage of development at these two places is not sufficient to enable us to estimate either the proven acreage or the probable production from proven land in Colombia. All we can do is to say that on geological evidence we think there is roughly five square miles of "probable" oil land in the two fields mentioned, all the rest must be thrown into the "possible" class.

In the Magdelena Valey above El Banoc there is a posibility of 20 to 30 square miles of "possible" oil land in addition to the probable oil land above mentioned.

Below El Banco it is necessary to consider the Magdelena River Valley in connection with that of the Rio Sinu on account of the many mutual relationships. Although we have worked in several parts of this region we do not feel competent to estimate the "possible" oil areas within it. The anticlines generally are narrow and sharp and on most of them it is not possible to reach the base of the Tertiary. In other words, most of them may never produce oil.

The district, however, is highly attractive because of the possibility that oil may have migrated long distances upward into the attainable Tertiary strata and because the Marine Tertiary of this region offers attractive possibilities as an additional source of oil. Our best guess is that there may be 30 square miles of "possible" oil lands in this district.

Concerning the Atrato River Valley neither of us know anything, except the region is most unhealthy. We understand that geologists have reported favorably on parts of this territory. We cannot make any estimate concerning it.

The west coast of Colombia so far as we can ascertain, has no known potential oil lands.

Philippine Possibilities

(Continued from page 48J)

several productive sands in the column, an ultimate yield of 10,000 barrels per acre may reasonably be allotted to this area. Thus a figure of 5,000,000 barrels is obtained as the probable ultimate production of the 300 square miles of oil-bearing rocks on Bondoc Peninsula.

The remaining 200 square miles of known oil-bearing rocks are to be set down, from our present knowledge, as slightly less promising than an equal area on Bondoc Peninsula. Therefore, a total ultimate probable production of 7,500,000 barrels for the 500 square miles of known oil-bearing rocks would appear to be a reasonable estimate.

The possibilities of the probable area of petroleum-bearing rocks in the Philippines must be estimated even less exactly than the probabilities of the known area have been. Presumably it will be conceded that the probable area promises less per average square mile than does the known area, but it is difficult to make a logical comparison of chances in the two classes of territory. For the purpose of this paper the probable area of petroleum-bearing rocks is taken as 15,000 square miles and this area is alloted one-fifth the chance per average square mile of the known area of petroleum-bearing rocks. This fixes the possibilities of the probable area at 45 million barrels, and the total probable and possible total ultimate production for the Philippine Islands becomes 52,500,000 barrels.

Japan (including Formosa) to the north of the Philippines and similar geologically had produced, up to the end of 1920 about 43 million barrels of oil and had a daily average production of about 5,800 barrels during that year. Japan accordingly might reasonably be expected to yield 60,000,000 barrels of oil ultimately, without important new discoveries. The Dutch East Indies-Borneo, Sumarta and Java—south of the Philippines and also similar to them geologically had produced more than 221,000,000 barrels of oil up to the end of 1920 and in that year averaged 48,000 barrels daily. The ultimate production of these islands, without important new discoveries ought to be 350,000,00.

(Note—An accompanying article on Japan, which seems to disagree with this takes into account "possible" territory, while Mr. Pratt speaks only of known resources of supply).

These figures give Japan an ultimate recovery of 345 barrels per square mile of total area and the Dutch East Indies 670 barrels per square mile of total area. If the Philippines, lying directly between these two producing areas and similar to both of them in geologic constitution, should produce a volume of petroleum per square mile of total area equivalent to their average production per unit area, (500 barrels per square mile) its total ultimate production would be 57,500,000 barrels; a figure which checks closely with the result of the estimate just presented. In other words, if the total ultimate production of the Philippines is, as estimated, 52,500,000 barrels then the ultimate production per square mile of total area will be 457 barrels as compared with 500 barrels average for the probable total ultimate production per square mile for Japan on one side and for the Dutch East Indies on the other side of them.

Intelligent Prospecting In Mexico Vital To Stability Of Industry

By Valentin R. Garfias
Manager, Foreign Oil Department,
Henry L. Doherty & Co.

THE year 1921 saw the flooding of the Southern fields with the exception of Cerro Azul and Toteco and the bulk of the light oil production confined to this limited area; at the present time it is estimated that the daily production of these fields, including the oil that is being taken out of the flooded areas is as follows:

	Barrels
Tepetate-upper Chinampa (stripping)	20,000
Naranjos, Amatlan, Zacamixtle (stripping)	100,000
Toteco-Cerro Azul	460,000
Alamo	10,000
Miscellaneous	20,000
	610,000

It will be seen that the present importance of these fields depends upon the productivety of the Toteco-Cerro Azul area, which yields about two-thirds of the total.

The Mexican fields producing light oil, as is well known, are located along the narrow strip running from Dos Bocas on the Tamiahua lagoon to Alamo on the Tuxpan river, and possibly to Furbero 30 miles south, thus forming a slightly curved belt about a mile wide and 76 miles in length. Excluding the present producing areas of this belt, there are about 30 miles which have been drained of oil and there remains about 30 miles between Alamo and Furbero, where the possibilities of extensions are questionable; seven miles between Alamo and Potrero, controlled by two companies which have obtained production although its real importance remains to be proven; about four miles between Potrero and Cerro Azul, likewise controlled by two companies and where the possibilities of encountering oil are not at present considered to be very promising, and an extension of five miles between Tepetate and Dos Bocas in which important development is going on at the present time and where there are strong probabilities of encountering oil although probably of a heavier grade (14°B) than the typical product of the region.

Although it is admitted that there are possibilities of encountering oil along the entire belt between Furbero and Des Bocas, in considering the availability of this supply for the purpose of counteracting the expected sharp decline of the present producing fields about the middle of this year, we can only consider the regions between Dos Bocas and Tepetate,—which so far has shown a heavier oil than to the south—and the region between Alamo and Cerro Viejo, in which producing wells have been encountered, although reports about this development have been of a contradictory nature.

Wildcat Wells

In the wildcat fields outside of the so-called *knife-edge*, the following wells are being drilled at present:

	Well No.	Ft. Deep
Chocoy	1	2560
Tamimas (Tempoal Valley)	1	2753
Comales	1	2400
Aguada	3	2600
Tamantao	1	3418
Idolo Island	1	2433
Palma Sola	1	1847
Tlacolula	1	1490
San Isidro	1	2390
Alamo No. 12	1	2615
Palo Blanco	2	Rig.
Jardin Cicuque	1	Rig.
El Dorado	1	1200
Castillo Teayo	1	Rig.
San Javier	1	1180
Agua Nacida	2	Rig.
Chinton (Panuco)	1	Rig.
Chila Cortaza	1	Rig.
Santiago de la Pena	1	40
	24	

The 24 wells which are being drilled with a view of locating entirely new productive regions are not near pipeline facilities and even if some of these wells prove successful their production will not compensate for the expected decline in the present fields.

Of late there has been considerable publicity given to the results of drilling in the Tehuantepec region and reports of a highly productive flowing well have been circulated. However, no definite information has been obtained regarding this development other than that the well in question has been ruined and its production become unavailable. Although it is very probable that the Tehuantepec region will again be commercially productive, the past record of its wells and the small amount of prospecting being carried on at present, tends to the conclusion that the production of this region will not increase soon enough to conteract the expected declines during the present year.

Summarizing the foregoing, we may state that there is a possibility, should an important producing field be developed between Tepetate and Dos Bocas in the next few months, that the intensive development of this area will to some extent make up for the decline of the Toteco Cerro Azul pools and so maintain the Mexican production near its present high level; and that the successful and intensive development of the region between Alamo and Potrero may serve the same purpose, but that in this case, owing to the large size of the holdings of two companies, the production would be more intelligently and economically handled and very likely the total exports from the Mexican fields would decline considerably below its present high rate.

Mexican Oil Taxes

The Ad-Valorem Tax: In a paper presented to the Institute a year ago, the writer recommended that Mexican oil taxes be figured on a more reasonable basis, and that volume rather than weight relations be employed; that the mooted question of the value of Mexican oils in Mexico as a basis for taxation be substituted by a relation to the average oil prices in the United States, and that other minor changes be made to conform as much as possible with the current American practice. As a result of this work and in accordance with independent studies made by the Mexican government, the ad valorem in operation a year ago, was abrogated and in its place a tax was put into effect as per decree of May 24, in which practically all the points above noted were incorporated. This tax has since been collected in full by the Mexican government from month to month, and its amount has fluctuated with the average American oil prices.

Infalsificable Tax: The paper redemption tax or infalsificable was abrogated and has not been collected since August 1, 1921.

The Export Tax: For the special purpose of taking care of the foreign debt according to arrangements which were to be made at a later date, the Mexican government instituted as per decree of June 7, 1921, a fixed tax, which was created by additions to the export tariffs of the country; this tax went into effect on July 1 and is in effect today.

In September a committee representing the Association of American Producers in Mexico headed by Walter Teagle held a series of conferences in Mexico City with Secretary of the Treasury de la Huerta with a view of revamping this export tax, and although the results of these conferences have not been officially made public, enough has been given to the press already to warrant with a degree of more or less assurance the statement that the general bases of the agreement are as follows:

Bases of Settlement

1.—The Mexican government advised the Teagle committee that it was willing to receive in payment for the export tax, Mexican bonds at their face value; in other words, the government would receive a one thousand dollar Mexican Bond for one thousand dollars worth of export taxes as per decrees of June 7th.

2.—The Teagle committee agreed to negotiate with the committee of bankers headed by Thomas Lamont with the object of obtaining its cooperation and the necessary bonds for carrying out the scheme; in other words the Teagle committee was to reach an agreement with the bankers, before being able to pay the tax with bonds.

3.—December 25, 1921 was set as the time limit on which the Teagle committee was to terminate the arrangements, it being understood that if by that time no agreement was reached with the bankers, the Mexican government was to receive in cash 40% of the taxes due from July 1 to Nov. 30, inclusive, representing the average cash price at which Mexican bonds might be procurred within those dates: —

4.—It is common knowledge that no agreement was reached prior to December 25 between the Teagle and Lamont committees and that the Mexican government extended the time for an indefinite period with the understanding that the term could expire with a ten days' notice from the Mexican government. It is further under-

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Independent Protests Against Rail Rates In Southeast States

By Special Correspondent
WASHINGTON, Feb. 24

THE SECRETARY of the Interstate Commerce Commission, G. B. McGinty, has received the following letter form P. F. Cosgrove of the Consumers Oil Co., Augusta, Ga., protesting against high railroad rates believed harmful to Independent oil interests in the southeastern territory:

"Our attention is directed to the proposed revision of petroleum rates from Ohio and Mississippi River gateways; south Atlantic and Gulf ports to various common and junction points in southeast ern territory.

"Plainly speaking, Augusta, Ga., is most grievously discriminated against in this tentative schedule and we wish to interpose serious objection to the publication of these rates as outlined.

"We will take for example the rates from Baton Rouge, New Orleans and Memphis to Augusta, rate as at present published being 47½ cents and which it is proposed to increase to 56 cents, an increase of 8½ cents a hundred. Then we will take the rates from Jacksonville, Fla., to Augusta, Ga., and from Savannah, Ga., to Augusta, Ga., where it is proposed to reduce the rates from 42 to 40 cents and from 37 to 33 cents respectively. The Standard Oil Co. ships all of their products to Savannah, Ga., by their own tank steamers, and then distributes by rail to interior Georgia points. The Gulf Refining Co. ships all of their products from Texas refineries to Jacksonville, Fla., by their own tank steamers and then distributes them by rail to interior points in Georgia and the Carolinas.

"The Independent marketers in this section have to get all, or practically all of their products from Independent refiners located in north or central Texas, and which products move through one or the other of the Mississippi river gateways, from which gateways it is proposed greatly to advance rates. You can readily understand the position of the Independent marketers in this section. Taking this city as an example. The Standard Oil Co. and Gulf Refining Co. will enjoy a decrease in rates amounting to from ⅛ to ¼ cent a gallon from their distributing depots; the Independent marketers will have to pay an increase amounting to You can well imagine what the result will 56-100 of a cent per gallon on his products. be.

"Is it not right and proper that the Independent oil interests should have a voice in anything pertaining to rate changes in territory in which they operate? If so, I wish to advise you that the Independent marketers of this city had no notice of any meeting to discuss the revision of petroleum rates, and the tentative schedule which only came into my hands yesterday, came as a very distinct shock to us as we were confidently expecting a reduction in the already unreasonably high rates on petroleum products from Texas points into this territory. Understand, please, that we are already paying a rate of 64 cents a hundred, or 4.22 cents a gallon. My information as to this tentative schedule came from the N. C. & St. L. railway and in their letter of transmission they advise:

" 'Conferences were held with the traffic committee of petroleum interests, C. B. Ellis, chairman, at Atlanta on Nov. 30, and at Washington, Jan. 10, at which time the fourth section committee submitted to the shippers' representatives a statement of present and tentative commodity rates from Ohio and Mississippi River crossings, Gulf ports and south Atlantic ports to all common and junction points in southeastern territory. At a subsequent conference held in Washington on Jan. 27th, the proposed rates were accepted by the shipping interests and the revised tarriffs will be promptly proceeded with by tariff agents and individual carriers.'

"I don't wonder that the proposed schedule was satisfactory to at least the chairman, Mr. C. B. Ellis, who is traffic manager of the Gulf Refining Co., inasmuch as the rates from the Gulf Refining Co.'s distributing depot, Jacksonville, Fla., to practically all interior points in Georgia and the Carolinas were substantially reduced. I should think he would be satisfied: in fact, he should be tickled to death. The same should be equally true of the traffic representatives of the Standard Oil Co. of Kentucky who are equally benefitted.

"I don't believe for one instant that your honorable commission will permit a condition of this kind to obtain, and I feel sure it is only necessary to direct your attention to the matter to have it immediately corrected. The condition confronting us is a most serious one, and we will greatly appreciate an immediate advice as to what action the commission proposes to take. The time before the publication of the proposed tariff is so short that we are going to venture to request that you review the facts in the case and communicate with us by telegram as to your views."

Sanitation Factor In Developing Oil Fields

WASHINGTON, Feb. 25.—Sanitation is a most important factor in the successful development of a new oil field, declared A. W. Ambrose, chief petroleum technoligist of the Bureau of Mines, before a recent gathering of Pan-American diplomats. Everyone is familiar with the fact that the construction of the Panama Canal was greatly delayed until problems of sanitation were conquered, said Mr. Ambrose. The health and contentment of the workers is a necessary adjunct to such a plan and companies should be urged to provide healthful and comfortable quarters for their men. If the camp is to be a permanent one, companies should also install adequate sewer systems. Where the camp must be built in a marshy locality, care should be taken to drain the camp site and surrounding territory to prevent the spread of malarial diseases.

The value of amusement halls and the promotion of social life in isolated communities cannot be overestimated. for the contentment of the staff and workmen is essential to successful development.

(Continued from page 48M)

stood that no agreement having been reached between the committees, the Mexican government a short time ago notified the Teagle commitee that the taxes from July 1 to December 1, 1921 inclusive, would be paid in cash at 40 per cent of their face value and that the taxes from December 1 on would be paid either full value in cash, or in bonds which could be furnished by the Mexican government in case the Teagle committee is unable to produce bonds from the committee of bankers.

5.—The Mexican government has repeatedly made the statement that the money levied from this tax would not be touched for any other purpose than for reducing the amount of its foreign obligations and that the money so collected would be turned over to some bank which would handle said funds for the specified purpose.

Summary

The information herein recorded may be summarized as follows:

1.—Production of the Panuco field will either remain stationary or gradually decline during 1922. Production from the fields yielding at present light oil should show a sharp decline during the year, beginning sometime during the summer.

2.—The decline of Mexican production may be partly neutralized if the development work now being started between Tepetate and Dos Bocas proves successful, also, if the result of an intensive drilling campaign between Alamo and Potrero meets the optimistic view held by some operators.

3.—Development of wildcat drilling in northeastern Mexico and the Isthmus of Tehuantepec, although of great importance as to the future supply, should not offset the sharp decline anticipated during 1922. Wildcatting is not being carried on in Mexico as intensively as the importance of the industry warrants.

4.—Notwithstanding all that has been written of late, it is quite evident that the conditions of he American oil industry did not warrant the very sharp decline in prices during the first half of 1921 and present conditions as regards factor of safety and stability do not warrant any further curtailment in prices; in fact, the American oil industry as regards supply and demand is now under normal conditions and the oil prices should correspond to such conditions.

5.—The absolute dependence of the American oil industry, and in fact, of the world's oil industry on Mexican production, is self-evident and a disastrous effect in the industry from a rapid curtailment of Mexican production will be the logical consequence. It follows that the intelligent development of the Mexican oil fields is a first necessity to the stability of the American oil industry.

6.—Mexican taxation is now levied on a reasonable basis and this will do a great deal towards stabilizing the world's petroleum industry which is absolutely dependent upon Mexican and American production.

The new, or export tax levied for the sole purpose of reducing its foreign obligations, is now in force and has been in effect since July 1, 1921, and has to be paid by exporters of Mexican oil either in cash or in Mexican bonds.

7.—Perhaps the outstanding feature of the Mexican operations during the last year has been the friendly undertone that has prevailed in all matters in which American operators and the Mexican officials have come in contact.

Japan Preparing To Test Areas Considered Possible Oil Bearing

By J. Morgan Clements

THERE are five productive oil districts in Japan proper, situated in the Provinces of Echigo and Shinano, Akita, Totomi, and Hokkaido and one in Formosa (Taiwan). In each of these districts there are one or more fields from which oil has been produced. In addition to the productive fields in Japan proper there are others which have been tested and have been proven to carry oil, but in such small quantities that the production is not profitable at this time.

Some new fields may be discovered in these districts but the relatively small area of unproven ground remaining precludes the probability that any large fields will be discovered. Of a total daily production in Japan of around 6,000 barrels, the oil districts of Totomi, Shinano, Hokkaido and Formosa (Taiwan) produced less than 100 barrels and are practically negligible from the point of view of present production. Echigo and Atika are the important fields, producing practically 99 per cent of all of the Japanese oil.

The oil fields of Formosa (Taiwan) are in process of development, a large part of the probable oil territory being reserved for the Imperial Navy, but the developments thus far have not been promising for a large production.

The west coast of the southern part of Sakahlin (Japanese Karafuto) has oil indications but no promising developments have been made thus far. A word or two regarding the Russian part of Sakahlin, over which the Japanese have recently extended their military and civil control, may not be amiss at this time and place. Excellent oil indications have been reported from Tertiary deposits in this Russian territory and the Japanese government having the knowledge of the oil possibilities and knowing the value of the great coal deposits in this part of Russia have occupied the territory and have proceeded with the development of the oil fueds. From the meagre reports filtering through it is known that these developments have not so far been successful. Factors operating against their success have been the difficulty of access and the severity of the climate which permits the Japanese to carry on their active prospecting for only about three months in the year. However, the failure of the Japanese to have developed commercially productive oil fields in Russian Sakahlin, or their failure even to eventually prove their existence, should by no means be accepted as proof that such oil fields do not exist there.

There are three well defined oil horizons. The upper one consists of shale, sandstone, and conglomerate, the middle one of shale with thin beds of sandstone. The lower is subdivided into two subordinate horizons, the top one consisting of sandstone and shale and the lower one of sandstone and shale with tuff beds. The most productive horizons are the middle and lower horizons and in these the sandstone and tuff are the chief oil carriers, though some oil is obtained from the shale.

The heavy oils as a rule occur in the higher horizons. Where an oil horizon is penetrated by an intrusive rock—not an uncommon occurrence—the oils are of low specific gravity even less than 10 degrees Baume having been found in small quantities. Generally speaking the Japanese oils are very heavy oils, a fair average for them being around 30 degrees Baume, with the heaviest being the Akita oil of 20 degrees Baume and the lightest being Totomi oil of 42 degrees Baume.

Depth of Wells

The deepest well so far sunk is one 4613 feet deep in the Nishiyama field of Echigo district. The wells generally run from a few hundred feet to around 2500 feet. The shallow wells are as a rule very small producers now.

The productive oil fields have in many if not in most cases been cery closely drilled. In the Niitzu field for instance oil wells may be found no more than ten feet apart, so that as a result of this close drilling the upper oil carriers have probably been very thoroughly drained and in such cases the use of air or water pressure methods will in all probability not add much from the higher sands. But deeper wells nearly everywhere may be productive.

The well production throughout Japan is small. The largest gusher of which I have record flowed 11,350 barrels per day at first but rapidly fell off and in 5 months it was necessary to pump the oil from it. Records show that at the end of 1912 there were 2740 producing wells in Japan of all types, machine drilled and hand dug, 2153 having been drilled with American type drills. In March, 1917, there were 2840 producing wells in Echigo District alone with 2236 drilled with American type drills, and the total production in March for this district was 158,733 barrels, or at the rate of about 56 barrels per month from each of these wells, or, say, 1.8 barrels per day. The average daily production of the Nishiyama field, the most productive one in Japan is 4½ barrels per day and the average for the entire Echigo district, including the Nishiyama field, is only 2.25 barrels per day. One company in 1917 was producing 4,000,000 cubic feet of gas per day in the Nishiyama field from which casing head gas was being extracted, the gas then being piped to adjacent towns and used for fuel.

Japanese Production

The published records of production date from 1874 in which year a production of 3499 barrels is given. The production slowly increased until it reached 30,651 barrels in 1880 when it began to decline and dropped to 7063 barrels in 1884 and again began to grow. By 1891 the annual production had reached 63,618 barrels. In the years immediately following, the result of the successful use of American drill machinery and methods made itself felt in a steady and rapidly increasing growth in production until by 1901 this amounted to something over 1,000,000 barrels. By 1908 it had reached something over 2,000,000 barrels. Production then fell off until 1912 when the introduction of rotary drills and the drilling of deeper wells caused the production to rapidly increase until it attained its maximum in 1916 at 2,942,722 barrels, with a value of $7,468,354, when it began to decline.

For the first 15 years from 1874 to 1899 for which there are records Japan had a production of around 261,000 barrels, for the next 10 year period, 1890-1899, the production was 1,991,993 barrels. From 1900 to 1909 the production was 13,046,378 barrels, over seven times that of the preceding decade, and from 1910 to 1919 it was 22,737,270 barrels. From 1920-1921 it was 4,413,000 barrels.

The total recorded petroleum production of Japan from 1874 to the present time has amounted in round numbers to 43,000,000 barrels.

Oil Reserves

I have been unable to learn of any estimate of the oil reserves of Japan which have been made by her oil geologists. Moreover, available data are so meagre regarding the productive areas, and much more so regarding the non-productive areas, as to make an attempt at a reasonably intelligent guess as to the reserves rather presumptive. Nevertheless while recognizing to the full the imperfect character of the estimate such an estimate has been made and is given below under heads of oil from "proven," "probable" and "possible" ground.

	Millions of Barrels
Oil ffom "proven" ground	90
Oil from "probable" ground	..300
Oil from "possible" ground	0-700

Under the head of Oil from "proven" ground is included only the oil which it is estimated will be recovered from the important producing districts some of whose fields have been well drilled, and regarding the occurrence of which certain data are available. It would seem that there is an excellent opportunity for the Japanese to continue production for some years from this "proven" territory. It is not to be expected, however, that any very marked increase in production will come from it. However, production from this "proven" ground will come largely as the result of the drilling of areas in the productive fields which have heretofore been untested or very poorly tested, from the drilling of deeper wells and by using new and improved methods of oil recovery, such as "oil pressure," "water drive," etc.

Accepting the estimated reserve of 90,000,000 barrels in "proven" ground as approximately correct, we have an amount which, at the normal average production for the past 10 years of a little over two and one-third million barrels per year, would be exhausted in a period of around 40 years. This is on the assumption that production continues in the future, at the same rate as at present. The production will certainly continue much longer than this, as under the normal conditions of drilling wells and developing oilfields it may be expected that the remaining oil could not be removed within that period of time. What will probably happen will be that we shall see a slowly but steadily decreasing produc-

tion from the old wells which will continue over a period of many years with an occasional small spurt shown by the coming in of a few isolated new wells. In fact it is very definitely my feeling that from the present production of around 2,200,000 barrels we will see Japan's oil production steadily decrease, barring developments of new oil districts in "probable" and "possible" ground.

Under oil from "probable" ground is included that oil which will probably be derived from certain rather extended areas totally untested in the present productive districts and other very much larger areas in which oil seeps are known and from which but small amounts of oil have so far been obtained, such areas, for example, as occur in Japanese Sakahlin (Karafuto), Hokkaido and Formosa (Taiwan). Thorough testing of these areas is very desirable and may add much to Japan's oil reserves.

Under the category of oil from "possible" ground has been included the estimates of oil in territory which is not definitely known to contain any oil, but in which such conditions of structure, etc., exist as to warrant the geologist in assuming that oil may occur there. It must be recognized as a purely speculative estimate and one that is very doubtful, is extremely doubtful in fact, for it is both doubtful whether any oil at all will be found in the areas considered, and if any oil is found, it is still a question as to how much will be produced. Testing such areas, however, may add enormously to Japan's "proven" and "probable" oil bearing ground and to the estimates of her reserves.

It may be well to add in conclusion that the officials of the various government departments interested in the production of and use of petroleum in Japan have been discussing an oil policy for Japan, and it is proposed to establish a bureau to carry on investigations and outline and carry through an oil policy which will conserve the oil supply of Japan, and if possible increase it. This increase, however, can only be brought about by active prospecting of the probable and possible productive areas of Cretaceous and Tertiary sediments which occupy a much larger area than that which is occupied by the present important oil producing districts of Japan.

Meager Data On China and Siberia Not Promising From Oil Standpoint

By Eliot Blackwelder

WITH political boundaries changign and imperial bonds dissolving, as they have been in recent years, it is not easy to say what constitutes "China" and "Siberia." For the purposes of this paper the boundaries of the Chinese Empire and of Siberia will be taken, therefore, as they stood about 1907.

Except in the Caspian region, neither China nor Siberia has yet produced oil in more than trivial amounts. It is doubtful if all the oil they have ever produced would equal a single day's delivery of a good healthy Texas well. Considering the vastness of the regions and the great variety of their geologic composition it seems very strange that these two great countries should have made so small a showing in the petroleum industry. No doubt the condition is due partly to lack of careful prospecting and modern methods of development. In larger measure, however, it is evidently due to unfavorable geological conditions over nearly all of east central and northern Asia.

CHINA

The known oil occurrences in China are very few. For many years, perhaps a barrel a day has been obtained by very primitive methods from wells near the city of Yen-Chang in the northwestern province of Shensi. A like amount was formerly obtained incidentally from wells bored for salt water in the vicinity of Kai-ting in southwestern Sze-chwan. The oil was separated from the salt water by allowing it to stand in jars and then decanting. These salt wells yielded also considerable natural gas, which is used for the evaporation of the salt and also for domestic purposes in the immediate vicinity. There is evidence that wells were bored in this part of China before the third century A. D. It is said that more than 1,200 wells have been sunk in that district to depths of 1,600 to 2,000 feet,—all in connection with the salt industry.

In China the scarcity of petroleum may be ascribed to three general geologic conditions. First, it contains practically no marine sediments of Mesozoic or Cenozoic Age. Second, its Palezoic sediments are not for the most part of those types which generally contribute petroleum. Third, the rocks of nearly all ages have long ago been strongly folded, faulted, and more or less intruded by igneous rocks in all parts of China except certain areas in the west and northwest. We may now consider the country briefly by geologic provinces.

The mountainous eastern peninsula of Shangtung and the similar districts of Liautung in Manchuria to the northeast have the general characteristics of our own Nevada,—the rocks being mostly Paleozoic or older and with complicated structure. That there is oil in either province is extremely doubtful.

The great plain of eastern China is believed to be a recently sunken district thickly strewn with the delta deposits of the Hwang-ho and Yang-tzskiang. If oil is ever found in this region, it will be purely by accident, as there are no rock outcrops to guide the geologist. The geologic structure of the surrounding districts gives no suggestion of favorable conditions beneath the plain, but rather indicates the continuation of the Shan-tung structures.

The southeast quarter of China consists entirely of Pre-Cretaceous rocks, —all strongly folded and faulted, and invaded by igneous intrusions. The probabilities of finding oil in this region would seem to be no better than in our own Appalachian Mountains.

In southwestern China the liklihood of finding oil is still more remote, for although thick beds of Carboniferous, Permian and Triassic rocks occur there, they have been intensely folded, and there are many granitoid and other intrusions.

Red Basin Possible

The Red Basin of the western Province (Cze-chwan) is one of the few places in China which seem to have even a little promise as a source of petroleum. The Jura-Triassic red beds are nearly horizontal in the central part of this great elliptical basin, but become more folded around the periphery. They are underlain by thin Triassic (Rhaetic) coal measures and the thick, more or less bitimunious, Pennsylvanian limestone. It is probable that there are structures favorable to oil accumulation around the margins of the basin. Nevertheless, it would be hazardous to expect much from this region in view of the fact that the Rhaetic or Liassic coal measures appear to be of fresh water origin, and there are no known sandy Formations older than upper Carboniferous limestone. Possibly there may be local porous zones in this limestone which would afford small oil fields like those of southeastern Kentucky. The small gas production and traces of oil in the southwest part of the province are at least suggestive.

In northwestern China, comprising the Provinces of Shansi, Shensi, and Kansu, there is a large area within which th Paleozoic rocks are more or less faulted but not much folded. Formations older than upper Caoboniferous are chiefly limestones and dolomites without bituminous matter, and are not such as to afford hope of finding oil. In the coal measures the hydrocarbon content is more favorable, but unfortunately these rocks generally lie at the surface in plateaus and have been deeply intrenched by streams. Perhaps in a few localities they may be under sufficient cover and in structural positions favorable for the accumulation of small bodies of oil, such as those in western Kentucky. It is in this part of China that a trifling amount of oil is being produced at present. That it will ever be more than an unimportant field seems rather unlikely.

Manchuria Not Promising

Of the outlying dependencies of China,—Manchuria, like northern China itself, consists largely of rather old, strongly folded rocks, broken by faults and interrupted by igneous intrusions. One can hardly suppose that it contains petroleum in noteworthy quantities .

Mongolia is largely unknown, as far as its geology is concerned. However, it has been crossed in several places by geologists and all their observations go to show that it is underlain largely by granite, gneiss, and metamorphosed sedimentary rocks, veneered with late Tertiary (Miocene-Pliocene) continental deposits like those of Western Texas and Nebraska, and including some basaltic flows. Nothing in the published accounts available indicates in the slightest degree that there is any oil in Mongolia.

Thibet, and Chinese Turkestan to the north, are likewise very imperfectly known. The rocks are, however, in-

tensely folded in most districts that have been studied. It is reported that Mesozoic and Eocene strata occur in southwestern Thibet; but their structure is like that of the Alps, and the opportunities for petroleum accumulation would seem to be about as poor.

SIBERIA

For the purposes of this paper, Siberia will be understood to include all of Russian Asia, as it was before the Great War.

Of this vast territory the most promising portion for future oil supply would seem to be the extreme southwestern corner, extending from the south end of the Ural Mountains south along the east shore of the Caspian Sea and east to the high ranges of Turkestan. Although this region seems to have been only partly explored, and although only a few localities have been tested by drilling, oil has already been produced in important quantities (a) along the east side of the Caspian Sea, (b) in the province of Uralsk to the north of that sea, and (c) in the Khotan Basin at the eastern corner of the triangle. In all three localities development appears to have been slow, and it is evidently still in its infancy. In this general region marine strata of Cretaceous and early Tertiary ages are apparently widely distributed and have been folded in varying degrees. Under the circumstances, it seems not unreasonable to expect that other valuable and probably large oil fields will be developed in the Aralo-Caspian portion of Siberia.

That part of Siberia lying between the Ural Mountains and the Yenesei River, is underlain largely by horizontal or slightly disturbed beds of Lower Cretaceous and early Tertiary age. In general they appear to be thin, and in part non-marine gypseous deposits. The marine strata resemble the American Chesapeake formation and the English Gault. There is not much in the descriptions of these beds to suggest that they will prove to be petroliferous. Yet it is possible that in the southwestern extremity of the district they may become productive, for it is not much farther to the southwest that the oil-bearing Tertiary strata of the Caspian region occur. Unconformably beneath the Cretaceous there lie folded beds of Paleozoic age which rise to the surface in the Ural, Altai, and Kirghiz mountains.

This vast region, two-thirds as large as the United States, has probably not been closely investigated by geologists, and such Russian reports as exist are largely inaccessible to Americans. Nevertheless, the general geologic conditions are known well enough to allow us to form a tentative opinion regarding the petroleum supply.

Between the Yenesei and the Lena Rivers there are plateaus carved from flat-lying or gently inclined beds of early Paleozoic age. They consist largely of limestone with marl and some gypsum. These are overlain by Permo-Jurassic coal measures suggesting the Gondwana beds of India. Devonian shales and limestones intervene in the southwest part of the region; and towards the north the coal measures are covered by a thin sheet of upper Jurassic and Lower Cretaceous shaly deposits. Locally there are extensive outpourings of Tertiary basalt. Around the southern border of this

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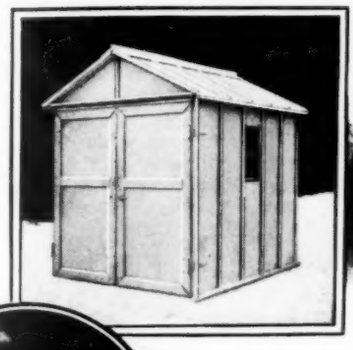

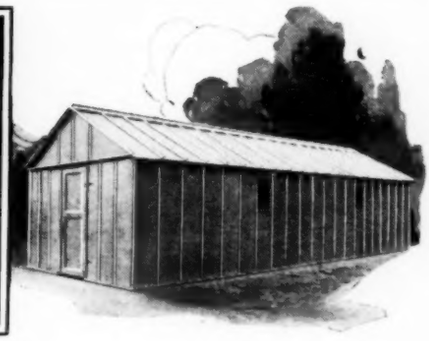

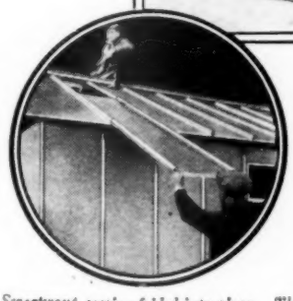

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district the rocks have been considerably folded. In brief, the conditions are such that it would not be unreasonable to expect some deposits of petroleum in this great region. Traces of oil,—apparently not worth exploiting,—have been found in the Paleozoic rocks near Lake Baikal; but the writer has not been able to find in the literature anything directly indicating oil pools.

East of the Lena River the rocks are generally folded in Appalachian style and are intruded by numerous masses of igneous rock. The beds range from Cambrian to Devonian in age with the addition of Triassic sediments and Tertiary volcanic deposits. In the valley of the Amur River and along the eastern coast, the Triassic beds contain fossiliferous limestone and thin coal measures. However, they have been so strongly folded as to suggest that no oil or gas will now be found in them. At the extreme eastern projection of Siberia the rocks are largely ancient metamorphic and igneous masses like those on the American side of Bering Strait.

The peninsula of Kamchatka consists partly of granite and porphyries, with a double line of volcanoes running longitudinally. There are, however, extensive outcrops of coal-bearing Tertiary deposits suggesting the Kenai formation of Alaska. This might conceivably yield oil.

Near the north end of the Saghalien Island the Tertiary formations are reported to afford petroleum seeps in at least two localities. The writer is not aware that oil has been produced as yet in commercial amounts; but there seems to be reason for expecting that Saghalien may eventually have some small oil fields like those of Japan.

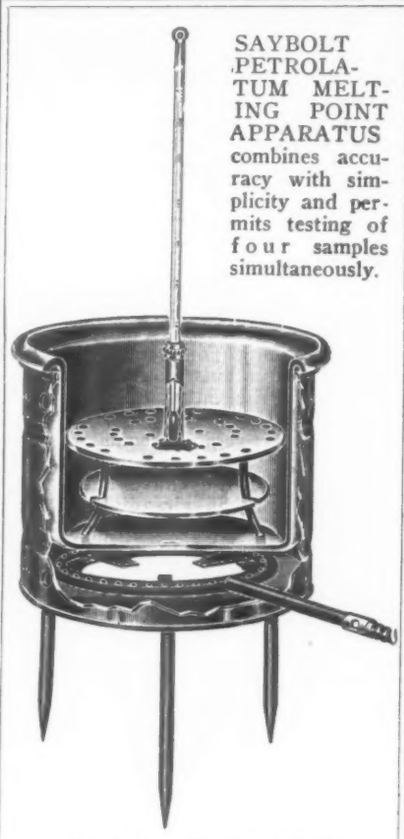
Summary

To give even a very rough quantative estimate of the petroleum to be derived from China and Siberia, after they shall have been thoroughly prospected, would, in the present state of our ignorance, be unjustified.

China and Siberia have a combined area nearly three times that of the United States. In this vast region indications of the presence of petroleum are found at only a few widely scattered places. Only in the Aralo-Caspian deserts are there developed oil fields in the modern sense of the word. In addition, the island of Saghalien offers promise of at least minor developments. We do not yet know even roughly the size of the petroliferous districts. We do not know the number of favorable structures in such districts, nor their areas. We know comparatively little of the average yield of the wells obtainable there. How, then, can we hope to make any calculation regarding the actual petroleum reserves?

By way of conclusion, the writer will venture only the opinion that China will never produce large quantities of oil, but that Siberia, with Saghalien and Caspian provinces, may eventually yield as much oil as Russia south of the Caucasus.

PROVIDENCE, R. I., Feb. 23.—Providence is rapidly becoming one of the largest oil ports on the Atlantic coast. The tonnage of fuel oil entering the port here in 1915 was 198,976 and in 1920, 1,274,729, an increase of 640 per cent.



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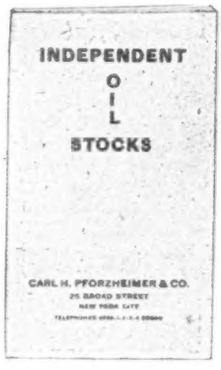

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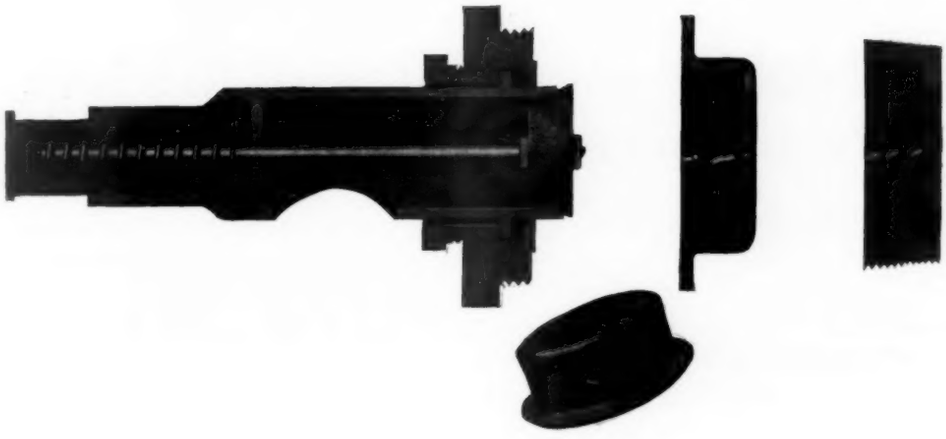

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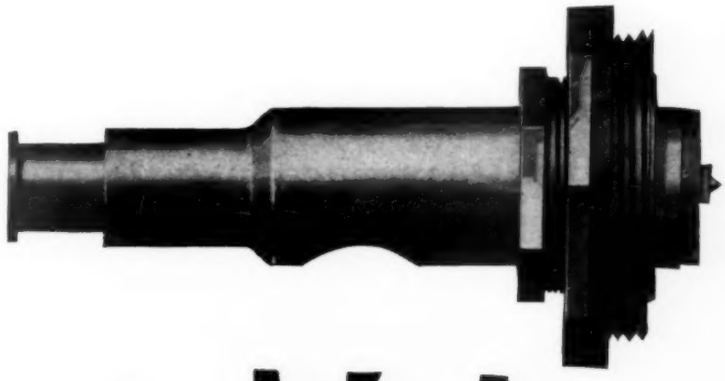

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Production And Imports Increase

THE producing situation of the United States was not materially changed during the past week. Judging from the standards which have prevailed in former times, there is every reason to act upon the apprehension regarding the price of crude oil and limit operations to a minimum.

In the Mid-Continent, the daily average showed an increase, so far as Oklahoma and north Louisiana went,, with other fields of the country maintaining the same approximate level as in the previous week. Imports continue at their highest rate and in consequence, stocks mount rapidly. The hope now is for an early spring and its big increases in gasoline demand.

Mexia Making 160,000 Barrels Daily

Through a number of completions, the daily average of the Mexia, Texas pool was maintained at about the same mark as the previous week, 160,000 barrels. Thoroughly defined as this pool is, and with the rapid rate of development it is undergoing, it is figured to register its big slump somewhere near the date when the decrease in imports from the Mexican light oil fields is effected.

Haynesville Pool Is Extended

In north Louisiana, the Haynesville pool, where prorating was established by the Standard of Louisiana Feb. 22, was extended a mile to the west of previous producing limits by the completion of a well which made 2,500 barrels daily initial. This pool is now making about 80,000 barrels daily and with the drillng now going on there can be expected to maintain this rate for an appreciable time, or even to run it higher than this when the demand justifies it. Twelve completions were registered there last week.

Panhandle Well Is Now Producing

In Carson county, Tex., the only oil well ever completed in this big gas area has been pumping again and makes 157 barrels daily. It was previously rated at 75 barrels. It is important for the time only as an indication of a future pool, its great depth and isolation from market pointing to the expenditure of millions before it is of any value commercially.

Oklahoma Wildcats Successful

In Creek county, Oklahoma, a wildcat is showing for a commercial well and in Okfuskee county, a test which has been doubtful for several weeks is flowing at a rate that indicates the opening of a good pool. Drilling in wildcat territory is proceeding at a rapid rate, wherever the supply of water permits. In Carter county, the Amerada pool recently opened, has another completion which is a small well from the shallower sand.

Wyoming News Without Feature

The chief interest in the Rocky Mountain territory now is whether a pipe line will be built as an outlet for the overproduction in Wyoming. A new rumor springs up each week, the newest being that of the Magnolia Petroleum Co. to Forsyth, Mont., and a refinery at Seattle.

Majority opinion, however, leans toward the rumored plans of the Prairie to build from Salt Creek to Mid-Continent connections and there is a strong impression that it will be built this year.

Late Field News

HOUSTON, Feb. 27.—Three new completions at Mexia, Limestone county, are No. 12 Ellis of the J. K. Hughes Oil Co., 1800 barrels at 3040 feet; No. 3 Hines, of Harry J. Parker et al, 4000 barrels at 3036 and No. 9 Liles of White Eagle Oil & Refining Co. swabbing 350 barrels, 20 per cent B. S. at 3050 feet.

Middletown-Tex Oil Co.'s No. 3 Brelsford, one mile northeast of the town of Eastland, in Eastland county, is a black lime territory well making 300 barrels at 3150 feet. The well is in Sec. 25, block 4, H. and T. C. Railroad survey. United Producers Pipeline Co., subsidiary of the Transcontinental Oil Co., is handling the oil at 15 cents premium.

* * *

HOUSTON, Feb. 27.—Humble Oil & Refining Co.'s No. 2 Kishi-Lang at Orange came in Feb. 26 for 5000 barrels initial at 4302 feet but developed leaky casing and began making 13 per cent B. S. The well will be killed and worked over in effort to make a producer. It is 1000 feet due west of No. 3 Chesson which at the 4000 foot level was Humble's 15,000 barrel Orange well about two months ago. Atlantic Oil Producing Co.'s No. 1 Sherrer at the northeast end of the Mexia pool, Limestone county, is a 1100-barrel producer at 3020 feet.

* * *

SHREVEPORT, Feb. 25.—An extension one mile westward of the Haynesville Louisiana pool resulted from the completion of the Wideman et al's No. 1 Shaw well in the southeast corner of the southwest of the southeast of 18-23-8. It came in for a 2500-barrel, finding the cap rock at 2708 to 2783 feet, drilling 10 feet into the sand below that level.

* * *

HOUSTON, Feb. 27.—Standard Oil Co. of Louisiana has posted a price of $1 a barrel for Bellevue crude produced in the shallow field of Bossier Parish, which tests 19.4 degrees Be.

Martial Law Is Lifted

HOUSTON, Feb. 28.—Governor Neff's issuance of proclamation officially lifts martial law in the Mexia oil district of Limestone county, effective March 1. Action was taken after pledge by citizens they would carry out enforcement measures.

Salt Creek Completions Increase; O'Brien Test Waiting On Casing

By Special Correspondent
CASPER, WYO., Feb. 24

SALT Creek, the famous oil field 45 miles north of Casper, was the center of all attraction in the Rocky Mountain region during the last week with seven wells either completed or far enough along to give a good gauge as to production, and favorable indications on still another well. The Inland Oil & Refining Co. No. 3 White tops the list as a 500-barrel producer on the southwest quarter of 18-40-78. The Wyo-Kans No. 2 well on the southwest quarter of the section and the Staley Syndicate's No. 4 well on the northwest quarter of 8-39-78, each are estimated to be worth 450 barrels.

The Wyoming Associated Oil Co. brought in a 440-barrel producer in the southeast quarter of 27-40-79 from the second Wall Creek sand. This is the Associated's No. 30-AX.

The Midwest Refining Co.'s No. 6-A on the northwest quarter of 7-39-78 has an estimated production of 360 barrels. This same company has a well that looks good for 250 barrels in its No. No. 33-A on the northeast quarter of 2-39-79.

The Western States Oil & Land Co. appears to have a fair producer in the No. 33-A on the southwest of the northwest quarter of 5-39-78. The well is now flowing 100 barrels daily between the casing, after the process of raising it. Pressure forced the tools up into the casing after the bit had penetrated the sand only a foot at a depth of about 2291 feet. Two hundred feet above the pay, the tools stuck in the casing and it is believed that they will have to be stripped.

It should be an easy matter to strip tools, and set a packer, after drilling on down lower.

There have been many wild rumors about the Mosher-Salt Creek Syndicate's well in 19-39-78 being a wonderful well, but the wise ones are waiting until the well is finally completed, which will be about March 9. This test in the southern part of the field means a lot to lease holders in that section and to the entire Salt Creek field in general. It extends the producing section of the Salt Creek district about a mile south of present production, should it prove all the operators claim for it. Its completion means the proving up of about 300 additional acres in this field.

The well recently blew out the plug and flowed for a time. Now the job of cementing has been completed.

Pipe for Gasoline Line Here

Nearly all of the pipe to fill the 40-mile contract of the Midwest has been received here by the National Supply Co. and is being hauled out of the city. The White Motor Co. has the contract for stringing the line, but no contract for ditching and filling has been let.

The line will be used for the transportation of natural gasoline from the Midwest's big establishment in the Salt Creek field into this city. The pipe is four inch, the joints averaging 38 feet in length and weighing 10¾ pounds to the foot. The Midwest plans to do its own welding. When the line is completed, the Midwest will have two pipe lines from Salt Creek to the Casper refineries for use in transporting gasoline. The other line is three inch. The product is blended locally with straight-run gasoline from the plants here.

The drilling rig and equipment of the Winona Oil Corp. on its lease in the Powder River field, in 34-37-85, has been sold by the sheriff of this county to satisfy a $1058 claim made by the Leidecker Tool Co. against C. Kirchner. The rig was on a location for a well which had been started several years ago by the company in which Kirchner was an officer.

Indian Leases Sale March 2

Leases on oil and gas on 95 tracts of land near Shoshoni, Fremont county, Wyoming, are to be offered to the highest bidder at a public auction which will be held on March 2, at 10 o'clock, in the office of Superintendent of the Shoshoni Indian Agency at Fort Washakie, Wyo. There are 92 tracts of 160 acres each and three which consist of only 80 acres.

The consumption of natural gas from the Lost Soldier, Ferris, and Mahoney Dome fields of Carbon county, Wyo., at the refineries of the Standard Oil Co. of Indiana, is gradually being increased. The total now is about 13 million cubic feet daily, and it is planned to increase this until it reaches a minimum of at least 30 million cubic feet. Through the completion of the telephone line, it is now possible for the management to call nearly any important point along the 90-mile line. This is the line owned jointly by the Midwest Refining Co. and the Producers & Refiners Corp.

Lack of water and extremely cold weather has proved a great handicap to drilling operations in the Red Desert country north of Rawlins in Carbon county. Many shallow ponds and springs have been frozen solid to the bottom, and the milder weather of the first part of the week was welcomed. Temperatures of 17 to 30 below the latter portion of this week, however, is expected to again slow matters up.

Watch Test at O'Brien Springs

The Ohio Oil Co.'s test at O'Brien Springs in Carbon county is being watched closely by scouts of many important companies. This test is located in 2-24-87 in the field which is 20 miles north of Rawlins. It is now waiting at 3812 feet for 4½ inch casing. The Ohio test had fine showings of gas, first at 3100 and then second at about 3620 feet. The deeper showing is being allowed to escape although the first was mudded off.

Not much of value is expected at less than 4000 feet.

The Ohio Oil Co. is so encouraged with the indications near here that it is starting a second test in the same region but about two miles east of the No. 1 test, and on Sec. 5-24-87.

Bair Oil Company Completes Job

Installation of heating coils for its two 55,000-barrel tanks in the Lost Soldier field, Carbon county, has been completed by the Bair Oil Company. This is expected to assist the Illinois Pipe Line Company to a large extent in running Lost Soldier crude. A third booster station was completed recently by the Illinois people, and is located between the Midway station and the Lost Soldier field.

Producers and Refiners Get Oil

Another good showing of oil has been reported by the Producers & Refiners Corp. in its No. 11 test located in 25-26-87 of the Ferris field, Carbon county, southern Wyoming. It is filling the hole quickly and allows about eight bailers per hour. Ten-inch casing is being set to shut off cavy formation. When this is completed the test is to be drilled on down to a deeper level. If it does not test enough for a commercial well, the hole is to be carried still deeper for the big gas production.

CASPER, WYO., Feb. 24.—With considerable gains in both the Salt Creek field of Wyoming and the Cat Creek field of Montana, the average daily pipe line runs in the Rocky Mountain district for the last week showed a healthy increase over the two previous weeks. Nearly all other fields slumped. Last week, a break in the Cat Creek pipe line caused a slump of nearly 2000 barrels daily in the pipe line runs, the total being only 3891 barrels daily. This week, with the line repaired, there was an increase which placed the daily runs larger than any of the two previous weeks. The runs averaged 5,375 barrels daily.

In spite of official temperatures ranging from 17 to 25 degrees below zero in Natrona county, the Midwest Refining Co. was able to crowd through an average of nearly 39,000 barrels of crude daily from the Salt Creek field. Had the mild weather of Monday and Tuesday of this week continued, it is believed that the average would have been 40,000 barrels daily or possibly greater.

The total for the Rocky Mountain region was 60,350 barrels daily or about 1,000 barrels greater than two weeks ago, the largest week of the last two previous ones.

The daily runs for the week ending February 24 follow:

Salt Creek	39,000
Cat Creek	5,375
Big Muddy	3,875
Grass Creek	3,850
Rock River	3,175
Lost Soldier	1,600
Elk Basin	1,800
Lance Creek	700
Ferris	200
Osage	225
Pilot Butte	100
Miscellaneous	450
Totals for week	60,350

GUNNISON, COLO., Feb. 24.—The test drilling 14 miles north of here, the No. 2 test of the Gunnison A-1 Oil Company is down to a depth of 500 feet. It will be recalled that the No. 1 test was abandoned after the tools were lost at 600 feet. This test was started back in the summer of 1920. It had showings of oil at 229 feet. The pay sands are expected at 800, 1200, and 1700 feet.

Operations In Mid-Continent Not Delayed By Fear Of Price Cut

Staff Special

TULSA, Feb. 27

LAST week's price cut in the Healdton district, and subsequent reductions and prorations at Haynesville and El Dorado have not so far been followed by any lowering of the market for Mid-Continent crude. While the fear that this territory is in line for a cut is quite generally felt, especially since the reductions above referred to, there has been apparently no special effort looking toward the further curtailment of field operations. A great deal of prospecting is under way, while established fields continue to expand and develop.

Production again shows an increase, the figures for Oklahoma being 336,000 this week as compared to 334,000 last week. With vast quantities of crude oil going into storage every day and with the pipe line companies handling daily approximately 60,000 barrels of oil ordinarily absorbed by refineries now shut down in the state, the situation looks not very cheerful from the producers' standpoint. But it is not any worse now than it has been for some time past, as the conditions mentioned have obtained for several months. It would appear that there is justification for the hope that, after having survived the past few months without a price cut, no cut now will be forthcoming.

The impending seasonal increase in the demand for gasoline with the opening of the motoring season, will undoubtedly serve to stabilize the crude price situation. The principal danger now is that indiscriminate drilling will result in large additions to production, which would serve only further to aggravate the situation.

By conservative and purely defensive drilling and by a curtailment of all operations liable to open up new pools, oil producers will probably come through the present uncertain and unsatisfactory period in good shape, although there are many operators who cannot see the thing in this light, and apparently figure on getting all the oil they can while the getting is good and let tomorrow take care of itself.

Creek County Feature

An outstanding item of the week's news is the wildcat well of the Kawfield Oil Co. located in the southwest corner of the northeast quarter of the southwest quarter of 22-16-10 in the hitherto unproductive territory lying between Slick and Kelleyville in Creek county. This well topped the sand at 2655 feet and at seven feet in, started flowing at the rate of 20 barrels an hour, although at present making only about 130 barrels a day. It has not been completed, but will be deepened to test out the sand, the result of which is being watched with a great deal of interest.

In the Burbank pool, a number of good completions have been recorded, adding to the interest with which this field is being watched on account of the coming Osage sale March 2, at which several tracts in the immediate vicinity of the pool will be offered. Burbank's production is approximately 43,000 barrels a day from 186 wells. The joint well of the Skelly Oil Co.—Phillips Petroleum Co. No. 3 located in the east quarter of 25-27-5, is flowing 1500 barrels from sand encountered at 2937 to 3025 feet. These companies' big well in the southwest quarter of this section, previously reported as No. 4 has been designated No. 1 in accord with the usual system in the Osage of numbering wells separately on each quarter section.

Other Burbank completions include the No. 7 well of the Gypsy Oil Co. located in the northeast quarter of 31-27-6, which found the sand at 2907 feet and was drilled to a total depth of 2973 feet, from which after a 100 quart shot it is producing 1200 barrels a day. The same company's No. 8 in the same quarter section, is a 2000 barrel well after a shot of 120 quarts in sand from 2912 to 2972 feet. The Prairie Oil & Gas Co's' No. 3 located in the southeast quarter of 30-27-6, Burbank pool is flowing 260 barrels after a 60-quart shot in sand from 2900 to 2967 feet.

The Lyons pool came through with its usual quota of big wells and now equals or possibly excels, Burbank in daily production and from only about one fourth the number of wells. In this field, the No. 6 Holmes of the Independent Oil & Gas Co., and Charles L. McMahon, located in the southwest quarter of the southeast quarter of 13-11-11, came in flowing at the rate of 3200 barrels a day, from sand topped at 2702 feet. The Josey Oil Co. No. 2, J. Barnett, located in the southwest quarter of the southeast quarter of 24-11-11, in the Lyons pool, is making 500 barrels a day in sand from 2612 to 2647 feet. In the Tonkawa field,

Mid-Continent Production

	Feb. 27	Feb. 18
Cushing and Shamrock	24,000	25,000
Healdton	20,000	21,000
Hewitt	33,000	33,000
Burbank	43,000	42,000
Oklahoma, general	216,000	213,000
Kansas	84,000	82,500
Total	420,000	416,500
Increase	3,500	

Completions in Oklahoma and Kansas for Week Ending Feb. 24. 1922

Company	Well No.	Location	Depth	Initial Prod.	Shot
Osage County					
Branstetter et al.	1	SE SW 2-21-11	1806-1811	38	
Deep Pool Oil Co.	11	NW NW 30-21-12	1404-1416	60	
United Okla. Oil Co.	2	SW NE 3-22-9	994-1019	18	60
A. P. McBride	4	NW SW 26-22-10	2050-2053	40	
Chestnut T. Smith	1	NW SE 4-22-12	1767-1792	500	60
Waite Phillips	5	SE 5-23-11	1670-1702	10&5M	60
Constantin Ref. Co.	2	SW NE 28-24-10	1345-1369	25	55
59-Osage Oil Co.	24	NE SW 12-24-11	T.D. 1683	Dry	200
Waite Phillips	1	SW 32-24-11	T.D. 1848	Dry	
Steyner Oil Co.	7	NE SW 24-25-9	2038-2132	60	180
Peters et al.	1	NW NE NW 33-26-11	1725-1750	5	80
Midland Oil Co.	44	NE SE 6-26-12	1457-1493	5	160
Roxana Pet. Corp.	5	SW SE 36-27-5	2878-2894	4M	
Wiser Oil Co.		NW SW 17-29-11	T.D. 1285	Abandoned	
		Burbank—Osage County			
Sinclair	10	SE NE 1-26-5	2863-2926	40&8M	24
Gypsy	8	NW SW 5-26-6	2856-2916	110	
Carter	3	SW NW 16-26-6	2825-2883	535	100
National Exploration	1	NW NE 2-26-7	2604-2708	200	
Roxana	5	SW SE 36-27-5	2878-2894	4M	
Prairie	6	10-26-6	2775-2855	150	20
Prairie	7	NW 4-26-6	2875-2958	1000	
Prairie	3	SW 30-27-6	2900-2967	Bridged	60
Prairie	11	SW 30-27-6	2875-2958	475	60
		Blaine County			
Ima O&G Co.	1	SW NW 7-18-10w	T.D. 2285	Abandoned	
		Carter County			
Page Oil Co.	2	SE NW 27-2S-3w (Old Well deeper)	2275-2338	80	
Simpson	4	SW SE 9-4-2 (Old well deeper)	2308-2374		
Simpson	6	SW SE 9-4-2 (Old well deeper)	1781-1851	210	
Gates Oil Co.	3	SE NW 15-4-2 (Old well deeper)	2190-2210	200	
Cotton Belt Oil Co.	7-A	NE NW 15-4-2	2120-2165	100	
Boston Oil Co.	8	SE 16-4-2	2288-2295	125	
Southerland Pet. Co.	3	NE SE 16-4-2 (Old well deeper)	2140-2170	220	
Southerland Pet. Co.	4	NE SE 16-4-2	2139-2177	125	
Gypsy	3	NE SE 21-4-2	2076-2135	60	
Carter	15	NE SE 21-4-2 (Old well deeper)	2160-2188	40	
Wolverine	94	SW NE 22-4-2	2005-2007	300	
Humble	3	SE SE 26-4-2	2269-2280	30	
		Creek County			
Emery & Sons	3	SW NE 2-14-8	2417-2476	65	80
Buell & Billingslea	1	SE SW 15-14-8 (Old well deeper)	3231-3269	560	
White O & G Co.	1	SW SE 22-14-8	2400-2455	20	80
Dominion Oil Co.	4	SW NW 16-19-11	1207-1222	15	90
Webster et al.	1	NE SW 24-19-14	1160-1172	5M	
Cates & Hamilton	1	SW 1-18-12	2058-2140	40	60
Gypsy	20	SW NE 9-17-12 (Old well deeper)	2372-2374	75	
Misener et al	1	NE SE SW 2-17-14	1454-1467	15	40
Wilcox	6	SE NE 13-16-9	2790-2810	125	
Phillips Pet & Waite Phillips	3	SE NW 27-16-9	2870-2819	750	
" "	4	SE NW 27-16-9	2895-2919	400	
Gypsy & Johnson	8	SW NE 28-16-9	2994-3006	400	

the White Eagle Oil & Refining Co., brought in a good one in their well located in the northwest corner of the southwest quarter of the southeast quarter of 10-24-1W., which is making 500 barrels natural from sand found at 2115 feet and three feet in. This well had four million feet of gas in four feet of sand at 2102 feet and was drilled on down with the above results. At Okemah, Okfuskee county, the Midwest & Gulf Oil Corp.'s well No. 1, E. P. Garrison, located in the southeast quarter of the southeast quarter of 2-10-9, has not yet been drilled in, but is making about 400 barrels a day as it stands, and is awaiting completion of pipe line facilities before being completed. This well is mentioned elsewhere at greater length in this issue.

In the Amerada pool near Ardmore, the Amerada Petroleum Corp.'s No. 2 Baptiste is showing for about a 40-barrel well at 1230 feet and will probably be completed at this depth. The same company's No. 1 on this farm, is making 80 barrels a day from the lower sand at 1559 feet, and flows about 30 barrels a day from the upper sand, which was found at 1312 feet. The well is still being swabbed.

A good well in the vicinity of Tulsa is that of W. F. Scott et al. No. 2 located in the northeast corner of the northwest quarter of the southwest quarter of 29-19-11, about five miles southwest of Sand Springs, which came in flowing at the rate of 1000 barrels a day one foot in sand found at 2430 feet. This company's No. 1 on the same farm, was drilled in last September. Its initial production was 500 barrels, and it is still producing 125 barrels a day. In the Slick district, Creek county, several good wells have recently been completed, among them the No. 3 Clinton of the Oklahoma Producing & Refining Corp., located in the northwest quarter of the northeast of 22-15-10, which is good for 350 barrels in the Dutcher sand from 2590 to 2621 feet. The same company's No. 2 is making 400 barrels in sand found from 2575 to 2607 feet. In the same section, the Sunrise Petroleum Co. completed its No. 4 Clinton located in the east half of the northeast quarter it being a 40-barrel well also in the Dutcher sand from 2587 to 2607 feet.

Haynesville Daily Output 80,000 Bbls.

Staff Special

HOUSTON, Feb. 28.—Up to the minute check of Haynesville, La., production shows a daily average of more than 80,000 barrels. Gilliland Oil Co. is running its production through pipe line to Homer storage, but pinching wells in excess of 23,000 barrels daily. Louisiana Oil Refining Corp. is handling roundly 21,000 barrels to storage and through its pipe line to Shreveport refinery. Gulf Refining Co. of Louisiana is handling its one-fourth of production from properties in which it owns undivided 25 per cent operating interest with Ohio Oil Co. Gulf also is running some outside oil for Roxana Petroleum Corp. Ohio Oil Co. is running to storage all it can of its 20,000 or more barrels net production after Gulf's one-fourth has been accounted for, but the Ohio is loading out some crude in tank car shipments. Other marketed oil goes to Standard of Louisiana, which has only the additional pipe line into the field besides the systems of Gilliland, the Gulf, and the Louisiana companies.

Completions in Oklahoma and Kansas for Week Ending Feb. 24, 1922

Company	Well No.	Location	Depth	Initial Prod. Shut
Wilcox	4	SW NW 18-16-9	2797-2825	50
Suppes et al	2	SW NW 9-16-12	T.D. 2437	Abandoned
Kawfield O & G	4	NW NW 9-15-10	2590-2665	125 20
Selby O & G	8	SE NW 10-15-10	2595-2936	30 90
Oklahoma P & R	4	SW NE 15-15-10	2607-2636	75 60
Indiahoma Ref. Co.	2	NE SW 22-15-10	2588-2590	4M
Magnolia	2	SW NW 14-18-7 (Old well deeper)	T.D. 3710	Abandoned
		Garfield County		
Sinclair	16	SE NE 25-22-4	2086-2125	70
Aubyne Oil Co.	2	NW SW 7-22-3	1618-1630	30
Sinclair	3	SE NE 19-22	1292-1298	48
		Garvin County		
Grimes Bros.	1	NE NW 1-2n-2w	T.D. 2514	Abandoned
Magnolia	1	NE SE 10-1n-3w	1529-1549	233
Homaokla	1	NW SW 11-1n-3w	1363-1390	10
McLaughlin et al	2	NW NE 14-1n-3w	1345-1369	37M
Broadgate Oil Co.	1	NW SE 27-1n-3w	T.D. 400	Abandoned
		Jefferson County		
Lone Star Gas Co.	1	SE NW 21-3s-4w (Old gas well)	1567-1570	2M
		Lincoln County		
Magnolia	1	SW NW 11-16-2e	T.D. 3540	Abandoned
		Muskogee County		
J. Slusher	2	SW SE 18-14-18	1150-1180	½M
		Okfuskee County		
Central National	1	SE SW 15-11-11	2667-2676	125
Kingwood Oil Co.	1	NE SE 24-11-11	2422-2435	540
Turman Oil Co.	1	SE SE 24-11-11	2441-2446	100
Turman Oil Co.	2	SE SE 24-11-11	2451-2465	300
Carter	5	NW NE 25-11-11	2445-2465	300
Carter	6	NW NE 25-11-11	2572-2597	1875
Lyons	2	SW NW 25-11-11	2605-2613	1000
Papoose Oil Co.	6	NW SE 25-11-11	2580-2612	50
Papoose Oil Co.	7	NW SE 25-11-11	2565-2575	350
Gypsy	4	NE NW 24-11-11	2744-2746	Abandoned
Preferred Oil Co.	2	SE NW 31-12-11	922-935	Abandoned
		Okmulgee County		
W. B. Pine	4	SE SE 33-12-12	2351-2367	200
Home Drilling Co.	1	SW SW 22-12 14	2125-2130	20
Nicholson	6	NW SW 28-12-14	1660-1677	10M
Lowery	7	SW NE 26-13-14	2008-2017	80
Test Oil Co.	9	32-13-14	1190-1230	30
Invader	6	NW NW 34-14-14	1188-1200	10
W. M. Hewitt	8	NE SW 26-13-14	T.D. 2856	Abandoned
Independent	9	SE NE 26-13-14	T.D. 2040	Abandoned
W. M. Hewitt	9	NE SE 21-14-14	T.D. 1840	Abandoned
Texas Co.	2	NW NE 1-15-14	T.D. 2140	Abandoned
Independent	10	NE SE 23-14-12	1680-1693	40 60
		Pawnee County		
League Oil Co.	1	NW NE 14-20-7	T.D. 2697	Abandoned
Moffet et al.	1	SW NE 22-20-7	T.D. 3110	Dry
		Payne County		
Magnolia	7	SE NW 27-19-4	3446-3494	60 10
Hale & Cassidy	14	S½ SE¼ 30-18-5	1777-1810	200
Skelly Oil Co.	6	NE NW 32-18-5	3250-3281	110 20
Home Gas Co.	9	NE NW 26-18-5	T.D. 3740	Dry
Magnolia	1	NE NW 31-18-5	3251-3254	Abandoned
		Pontotoc County		
Carter-Lowrie	2	NW 4-4-5e	1740-1766	2 Oil, 10 water
		Stephens County		
Magnolia	1	NE SE 32-1n-8 (Old well deeper)	2190-2191	8M
		NE SW 26-1s-5	720-730	14
Skelly	12	NW SW 34-1s-5	1095-1115	3M
Magnolia	6	SW NE 34-1s-5	727-751	10
E. C. Hall	4	NE NE 34-1s-5w	690-724	15
Westheimer	6	NW NW 35-1s-5	687-706	10
Adams and Prince	7	SE SE 35-1s-5	568-583	12
Skelly Oil Co.	10	NE SW 36-1s-5	400-435	2
Magnolia	1	NE NE 14-2s-5	T.D. 1160	Abandoned
Majestic Oil Co.	1	SW NE 24-1n-8w (Old well deeper)		Abandoned
Butler et al	1	NW 22-1s-8w	T.D. 2553	Abandoned
Atlantic Oil Prod.	1	NE NE 32-1s-8w	T.D. 2310	Abandoned
Phillips Pet. Co.	1	NE SE 33-1s-5w	T.D. 1115	Abandoned
Lone Star Gas Co.	1			
		Waggoner County		
Waggoner O & G Co.	5	SE NE 25-17-17	560-571	4M
M. T. C. Co.	4	SE NW 21-18-17	862-883	75
Tidal Oil Co.	10	**Washington County**		
		W½ NE 19-27-13		25
		KANSAS		
		Butler County		
T. C. Johnson et al	1	SW SE 14-28-5	T.D. 2805	Dry
Shayer, Sutter et al	3	SE 23-28-5	2721-2785	200 15
Lewis Oil Co.	5	NE SE 25-29-5	2729-2764	75 60
Atchison et al	1	SE 8-29-4	T.D. 1890	Dry
		Chase County		
Dutton & Gillespie	1	NE 7-22-7	T.D. 2552	Dry
		Cowley County		
Benedum & Trees	1	SW 5-32-5	T.D. 2346	Dry
		ElkCounty		
Merriam & Findeiss	1	NE 21-28-11	T.D. 1206	Abandoned
		Greenwood County		
Florence Oil Co.	3	SW 16-23-13	1824-1830	35 40
Atlantic Pet. Corp.	4	NE NW 21-23-13	1678-1698	20 50
Rodgers, Bittler et al	3	NW SW 10-26-8	2453-2501	100 100
R. G. Gillespie	1	NE SE 20-23-13	1705?	25
Vincent Oil Co.	2	NW SW 12-24-12	1760	30
Atlantic Pet. Corp.	5	NW NE 22-23-13	1800	40
Atlantic Pet. Corp.	4	NE NW 21-23-13	1693	30
Paul & Ache	3	SW SW 16-23-13	1764	115
		Marion County		
C. J. Flanagan	1	NE NW 33-18-4	T.D. 2625	Dry
Ward & Wilhoit	3	NE NE 8-22-4	2485-2490	200

Crude Market Soft In North Louisiana; Haynesville Production Details

Staff Special
SHREVEPORT, LA., Feb.26

SHREVEPORT-El Dorado Pipeline Co's. reduction of 25 cents a barrel on South Arkansas crude, announced Feb. 23, reflects a condition in the North Louisiana refining territory under which it is now possible for the smaller Independent refiner to obtain raw material more cheaply than has been recently the case. Although El Dorado, Ark., production has declined steadily until the daily average last week was 36,650 barrels, fully one third of the Haynesville, La., output is in the hands of producers without refinery affiliations.

A combination of the Haynesville situation (which has resulted in the prorating of runs by the Standard) and the changed condition under which Independent agencies have purchases more their own way may be considered to have brought about the El Dorado reduction. The Standard Oil Co., of La., dominant purchasing factor at both Haynesville and El Dorado, has not met the cut and it may be said that conditions affecting the Standard itself will influence whatever action, if any, it may take.

The Shreveport-El Dorado Pipeline Co's. new schedule of prices provides for purchase of South Arkansas oil grading 34 Be., gravity, and above at $1.75 a barrel; 32 to 33.9 gravity, $1.50; 30 to 31.9 gravity, $1.25. Late in January this company's control of oil at El Dorado for Shreveport, where it serves refining plants which co-operated in its construction, totalled nearly 4,400 barrels daily.

Early in the present month, the Standard announced it would make no more connections to stock tanks at El Dorado, because its storage was practically full. Its runs from the field at that time were roundly 13,000 barrels daily. Since that time the congestion that resulted in the Standard prorating runs at Haynesville developed and the policy became effective Feb. 22, as previously announced.

El Dorado is some 36 miles northeast of Homer, La., production and Haynesville is 12 miles north of Homer. The Standard's pipeline to El Dorado extends into south Arkansas via Haynesville, at which latter point steel storage is being constructed to handle the excess oil above 50,000 barrels daily for which the Standard has facilities. As previously announced, the Standard will pay the previously prevailing market for Haynesville oil it has facilities to run but will handle to storage the excess of production at a posted price 35 cents a barrel lower.

Area Gives Up 135,000 Bbls.

In this general area, daily average production is distributed among pools as follows:

Pool	Barrels
Haynesville, La.	79,108
El Dorado, Ark.	36,650
Homer, La.	19,486
Total	135,244

Of the total average daily production at Haynesville, 50,456 barrels is in the hands of the three companies that control the solidly blocked center of the development. Smaller interests, or those whose holdings in the field are nominal in comparison with the three principal operators, control 28,652 barrels daily.

The development of companies whose interests are relatively small fringes the known productive area but the quantity of oil to be brought in with the completion of new wells has possibilities of being still further important. On the "inside" territory, Ohio Oil Co., (Standard), in whose operations the Gulf Refining Co., of La., has an undivided one fourth interest, is drilling roundly 100 wells. A considerably smaller number are being put down by the Louisiana Oil Refining Corp. (subsidiary of the Invincible Oil Corp.) and the Gilliland Oil Co., for which latter George O. Baird of Shreveport is the Louisiana receiver.

What Principal Operators Control

Field records showing the disposition of crude among the three principal Haynesville operators show up as follows:

Gilliland Oil Co.

Company-Lease	Number of Wells	Daily Production
Bond	C-3	731
Bond	B-3	686
Bond	A-2	312
J. H. Coon	1	2,071
De Loach	4	7,743
Sherman	1	off
Stonecipher	2	off
Anna Taylor	5	917
Guy Taylor	1	8
G. W. Taylor	4	17,292
Totals		**29,760**

Louisiana Oil Refining Corp.

Bond	9	1,438
Boone	1	605
De Loach	1	436
Goodwin	2	112
Stonecipher	2	349
A. Taylor	2	77
Waller	5	4,900
Totals		**7,917**

Ohio Oil Co.

R. J. Bond	4	off
Camp, Acct. 1	2	260
Camp, Acct. 2	1	70
Garrett	1	90
Hearne	2	245
Hilburn	1	2,747
Hunt	A-2	110
Hunt	B-1	150
Milner	3	1,360
Milner Acct. 2	1	2,673
Shady Grove Church	1	off
T. W. Sherman	2	1,975
Anna Taylor	9	1,869
Silas Taylor, Sr.	2	100
Totals		**12,779**

The production of other companies operating in the Haynesville district is distributed as follows:

Company-Lease	Number of Wells	Daily Production
Gulf Ref. Co. of Louisiana		
Silas Taylor	1	150
Total		**150**
Haynes Brothers		
Braselton	1	off
Total		**off**
Houston Oil Co. of Texas		
Knox	1	540
White	1	840
Total		**1,380**
Ahefeldt et al.		
Haynesville Lbr. Co.	2	90
Ware	1	210
Total		**300**
Amerada Petroleum Co.		
Hudson	3	3,451
Total		**3,451**
Arkansas Natural Gas Co.		
Aiken	4	50
Knox	12	620
Total		**670**
Belchic & Lasky		
Orr	1	375
Taylor	3	1,780
Total		**2,155**
Bernstein et al		
Goree	2	105
Total		**105**
C. O. Day, Trustee		
De Loach	2	716
Goree	1	off
Total		**716**
Deep Sand Oil Co.		
Goree	1	75
Total		**75**
Florsheim et al.		
Goree	1	off
Total		**off**
Hunt & Smith		
Garrett	1	230
Total		**230**
Humble Oil & Refining Co.		
Braselton	2	77
Hearne	2	112
Kennedy	2	324
Knox	3	3,857
Total		**4,570**
Livert Oil & Gas Co.		
Hudson	2	1,978
Total		**1,978**
Loewenberg et al.		
Barker	1	225
Total		**225**
Palmer Trust		
Goree	1	30
Orr	4	685
Williamson	3	725
Total		**1,440**
Roxana Petroleum Co.		
Bond	5	3,014
Lowe	2	422
Williamson	4	138
Total		**3,574**
Section 27 Oil Co.		
Aiken	1	50
Total		**50**
Smitherman & McDonald		
Goree	1	off
Goree	A-1	off
C. Taylor	3	1,129
C. Taylor	A-2	1,407
Total		**2,536**
Standard Oil Co. of Louisiana		
Aiken	3	135
Barker	A-4	972
Barker	B-1	1,430
Total		**2,530**
Tarver Oil Co.		
Mack Orr	2	172
Total		**172**
Tarver & Murphy		
Callie Aiken	1	210
L. F. Aiken	3	270
Total		**480**
Phillips Petroleum Co. (V.K.F. Drilling Co.)		
Goree	2	75
Total		**75**
Wideman et al.		
Hunt	3	785
Total		**785**
Zeigan et al.		
Braselton	1	405
Williamson	3	600
Total		**1,005**

(Continued on page 54)

(Continued from page 53)

With possibilities that Haynesville will show final recovery of 115 million barrels **(National Petroleum News,** page 48, Jan. 18, 1922) it will be apparent that the potentialities of the "inside" development of this Claiborne parish pool have been indicated rather than any considerable part of them actually reached by producing activities.

As regards El Dorado, Ark., where structural conditions made for unusually rapid decline from the flush showings of wells, its possibilities are considered not to show for material increases in daily production from present levels. New production, both "inside" and from outliers of development, must be expected only to offset the decline of old wells.

At present, principal interest in El Dorado outliers is around the two gas wells recently completed in 17S-14W, where a number of other tests are drilling. In 26-17S-14W, the Terry Fields Oil Co. completed No. 1 Smith as a dry gasser, making 10 million cubic feet, at the 2300 foot level. Northward, in Sec. 23, the South Arkansas Oil & Development Co. completed its McCurrie test as a gasser with a show of oil at 2175 feet.

Production Still On The Climb In North Louisiana Territory

By Special Correspondent

SHREVEPORT, Feb. 25.—During the past week daily average pipe line runs in the Shreveport territory aggregated 148,200 barrels, an increase of 4,200 barrels during the seven days. The El Dorado district of Arkansas showed a decrease of 1,400 barrels, but Haynesville recorded an increase of 5,400.

	Last Week	Previous Week
Caddo light	7,300	7,400
Caddo heavy	3,500	3,600
DeSoto-Red River	7,300	7,300
Haynesville	76,400	71,000
Homer	19,100	18,700
El Dorado	34,600	36,000
Total	148,200	144,000
Total	148,200	144,000

SHREVEPORT, Feb. 25.—INITIAL production in the north Louisiana and south Arkansas districts showed a wholesome increase, amounting to 5409 barrels, during the week just closed, with a difference of only two in favor of the previous week, in the number of new producing wells. There were 40 completions during the past week, of which two were gassers, six failures, and 32 producers, with combined initial yield 27,300 barrels compared with the previous week's record of 35 completions, including one gasser and 34 producing wells with total initial yield 21,981 barrels.

There were no completions reported in Homer, DeSoto, or Red River parishes, the result being confined to Haynesville, El Dorado, Bellevue, Caddo and East Texas, with the first three named districts showing increased production, and with Haynesville far in the lead.

Twelve completions comprised the Haynesville record. One of these was a failure, the Hearne well of the Walker Consolidated Petroleum Co., which encountered salt water at 2776 feet in 28-23-8. The others were producers, whose combined initial production totaled 21,725 barrels. During the previous week Haynesville showed the same number of producers, but its initial production was only 18,826 barrels. The increase for Haynesville, therefore, was 2889 barrels for the past week.

In the El Dorado district there were half a dozen more new producers than in Haynesville, but the initial yield in the latter district was nearly five times as large. The Haynesville district also outstripped all others in daily average production, with a total of 76,400 barrels against El Dorado's 34,600, and an increase for the week amounting to 5400 barrels against El Dorado's decline of 1400 barrels.

El Dorado during the week, from 17 producers, recorded 4715 barrels of initial production, also one gasser and three failures, against the previous week's record of 18 producers with initial yield 3020 barrels.

New Producers in Bellevue

In the Bellevue shallow sand district of Bossier parish there were only two completing, one a failure and the other a 300-barrels producer. The producer is the Standard Oil Co.'s Louisiana Oil Refining Corp.'s No. 1 in 11-19-11, at 289 feet, while the failure is the Parsons No. 1 of Keen & Woolf in 10-19-11 at 280 feet, salt water the cause. The Bellevue initial yield was nearly six times as large as that of the previous week, when two wells together showed only 55 barrels.

Two other completions, not yet formally listed, are reported from Bellevue during the latter part of the week, namely: Louisiana Oil Refining Corp.'s A-1 in 15-19-11 at 386 feet, estimated approximately 150 barrels the first hour, and the Standard Oil Co.'s No. 1 Louisiana Fee in 11-19-11 at 285 feet, estimated at about 500 barrels. A number of other wells are drilling in Bellevue and it continues to attract a great deal of attention. Its operations are promised encouragement by the building of a pipe line to the new district by the Standard Oil Co., whose plans were recently announced, work to start without delay.

Caddo parish showed three completions last week, with combined initial yield 650 barrels, against the previous week's record of one gasser and three producers with total initial yield 1080 barrels.

El Dorado's Wells Small

There were only two wells in El Dorado with initial production exceeding 500 barrels, while Haynesville had five of its 11 producers gauging 2000 barrels or higher. The two El Dorado completions referred to were the Carrol No. 2 of the Associated Producing and Refining Co. in 29-18-15, at 2156 feet, 1000 barrels; and the Mann No. 1 of the Fullilove Drilling Co., in 29-18-15 at 2158 feet, 800 barrels.

Gushers in Haynesville

The largest completion of the week was the Taylor A-4 of the Gilliland Oil Co., in 14-23-8, completed at 2797 feet, with initial yield 7000 barrels. Second largest was the Louisiana Oil Refining Corp.'s Waller No. 7 in 14-23-8 at 2799 feet, 2000 barrels. The Ohio Oil Co. had four producers to its credit, two of them with initial yield totaling 6500 barrels, namely: Hearn No. 4 in 22-23-8 at 2792 feet, 4100 barrels, and Milner No. 6 in 22-23-8 at 2801 feet, 2400 barrels.

Completions formally listed during the week were as follows:

Bossier Parish (Bellevue District)

Keene & Woolf's Parsons No. 1 in 10-19-11 at 580 feet, salt water.

Standard Oil Co's Louisiana Oil Refining Corp., No. 1 in 11-19-11 at 289 feet, 300 barrels.

Caddo Parish

Dixie Oil Co's Robertshaw No. 24 in 24-21-15 at 2951 feet, 75 barrels.

Woodbine Oil Co's Robertshaw No. 1 in 23-21-15 at 2811 feet, 175 barrels.

Woodley et al's Noel No. 3 in 25-21-15 at 2385 feet, 400 barrels.

Claiborne Parish (Haynesville District)

Gilliland Oil Co's. Taylor A-4 in 14-23-8 at 2797 feet, 7,000 barrels.

Humble Oil & Refining Co's Kennedy No. 1 in 16-23-8 at 2786 feet, 500 barrels.

Louisiana Oil Refining Corp's Beene No. 5 in 15-23-8 at 2784 feet, 6 million cubic feet of gas and 75 barrels of oil.

Louisiana Oil Refining Corp's Deloach B-3 in 22-23-8 at 2799 feet, 2,000 barrels.

Louisiana Oil Refining Corp's Waller No. 7 in 14-23-8 at 2783 feet, 5,000 barrels.

Ohio Oil Co's Bond No. 3 in 21-23-8 at 2792 feet, 50 barrels.

Ohio Oil Co's Hearn No. 4 in 22-23-8 at 2800 feet, 4,100 barrels.

Ohio Oil Co's Hunt No. 3 in 16-23-8 at 2816 feet, 125 barrels.

Ohio Oil Co's Milner No. 6 in 22-23-8 at 2801 feet, 2400 barrels.

Smitherman & McDonald's Hudson No. 1 in 17-23-8 at 2805 feet, 275 barrels.

Smitherman & McDonald's Taylor No. 3 in 16-23-8 at 2798 feet, 200 barrels.

Walker Consolidated Petroleum Co's Hearne in 28-23-8 at 2776 feet, salt water.

Hopkins County, Texas

National Oil Co's Smiley No. 1 in Simmons H. R., salt water.

Panola County, Texas

Texas Co's Humble No. 1 at 1965 feet, 10 million cubic feet of gas.

El Dorado (Arkansas)

Amerada Petroleum Corp's Rowland No. 4 in 5-17-15 at 2130 feet, 70 barrels.

Arkansas Natural Gas Co's Woods No. 234 in 29-18-15 at 2184 feet, 3 million cubic feet gas.

Ark-Texas Oil Co's McWilliams No. 1 in 5-18-15 at 2282 feet, salt water.

Ardmore-El Dorado Oil Co's Bird No. 1 in 5-18-15 at 2207 feet, abandoned.

Associated Petroleum & Refining Co's Carroll No. 2 in 29-18-15 at 2156 feet, 1,000 barrels.

Clark & Greer's Burns No. 2 in 32-18-15 at 2163 feet, 100 barrels.

Constantin Refining Co's A. Hinson S-1 in 7-18-15 at 2184 feet, 75 barrels.

Constantin Refining Co's Thompson No. 3 in 19-18-15 at 2178 feet, 100 barrels.

Fullilove Drilling Co's Mann No. 1 in 29-18-15 at 2178 feet, 800 barrels.

Gulf Refining Co's Gates No. 2 in 33-18-15 at 2151 feet, 180 barrels.

Gulf Refining Co's Gates No. 3 in 33-18-15 at 2142 feet, 1,500 barrels, 40 per cent b. s.

Gulf Refining Co's Thurkhill No. 7 in 29-18-15 at 2175 feet, 100 barrels.

Harrell & Hatcher's Burns No. 1 in 32-18-15 at 2142 feet, 200 barrels.

Humble Oil & Refining Co's Carroll No. 2 in 29-18-15 at 2165 feet, 150 barrels.

Lucille Oil Co's Smith No. 2 in 18-18-15 at 2175 feet, 65 barrels.

Morris Drilling Co's Woods No. 1 in 20-18-15 at 2175 feet, 250 barrels.

J. L. Nelson's Buswell No. 1 in 19-18-15 at 2194 feet, 125 barrels.

D. C. Richardson's Garrett No. 2 in 4-19-15 at 2203 feet, 150 barrels.

South Arkansas Oil & Gas Co's McCurry No. 1 in 19-17-14 at 2191 feet, abandoned.

Southern Oil & Land Co's Armstrong No. 9 in 31-17-15 at 2190 feet, 100 barrels.

Weis Oil Corp's Thurkhill No. 2 in 29-18-15 at 2150 feet, 350 barrels.

Mexia New Development Holds Up Field Mark To 160,000 Barrels

Staff Special

HOUSTON, Feb. 25

NO. 3 on the A. E. Berthelson (west) tract of the Humphreys-Mexia Co., is a current completion for 11,500 barrels, daily maximum, at the usual Mexia "big pay" depth. This completion, and a number of normally flush wells in the Limestone county field, hold the production for the current week around the daily average accredited to the development area in the previous seven days—160,000 barrels. "Wildcat" tests outlying from the field proper, as well as others farther removed from production in the general Woodbine sand territory of East Texas, failed uniformly to reach interesting stages in the week under review.

"Inside" completions at Mexia included the following:

J. K. Hughes Oil Co., No. 9 Ellis, 3020 feet, 2300 bbls.; No. 12 Ellis, 1800 bbls.

Providence Petroleum Co., No. 2 Koenig, 3054 feet, 1500 bbls.

Simms Oil Co., No. 2 Mackey, 200 bbls.

Humphreys-Mexia Co., No. 1 Hester Ross, 3025 feet, 3000 bbls.

H. J. Parker et al, No. 3 Hines, 4000 bbls.

The Texas Co., No. 2 Slaughter, showed salt water at 3047 feet and its No. 2 Harris stopped flowing.

Nu-way Oil & Leasing Co.'s test on the Cheneyboro tract, north of the Seay & Cranfil gasser, in the area north of the Currie well of the Humphreys-Mexia Co., Navarro county, showed a little oil in the hole but field opinion does not credit it with possibilities of making a commercial well. It was bailed down to within 200 feet of the bottom at total depth of about 3100 feet.

On the Grinnan tract, in Kaufman county, the Panhandle Oil & Refining Co. is reported to have tested dry at 3250 feet in a "wildcat" test that, however, has not been abandoned.

Central North Texas

Development outliers from the black lime territory of central north Texas took on interest over the week as a result of the best wells so far encountered in either of the pools coming in at Pioneer, southwestern Eastland county, and in northeastern Shackleford county.

Stone & McMurray completed a well on the Teston property, in the Pioneer pool, which made 600 barrels initial production, in sandy lime at the 2500 foot level. The well is five miles southwest of the Hillborn development and near the Eastland-Callahan county line. Some half a dozen smaller wells previously had been drilled in this area, which is three miles southeast of the old Vestal well, which two or three years ago showed small quantities of oil for the Consolidated Oil Co., of Texas.

In Shackleford county, the Ibex Oil Co. (former Governor Shoup of Colorado and others) brought in No. 1 Lynch for 400 barrels at total depth of 3625 feet. The well is a half mile north of the old No. 2 Poindexter well of the same interest. This development is along the east line of the county some 12 miles north of the shallow

HOUSTON, Feb. 26.—Daily average production over the week for the Texas fields is as follows:

	Past Week	Previous Week
Mexia	150,000	160,000
Somerset	1,530	1,645
Coastal Louisiana	4,797	4,650
Coastal Texas	103,370	103,800
Wichita Falls	52,950	52,019
Ranger Lime	65,675	65,700
Ranger Sand Inc. Young Co.	12,500	12,025
Totals	390,812	399,839

sand production of The Texas Co., in the Moran pool.

Amarillo Well Pumping

Gulf Production Co., which more than a year ago completed its No. 2 S. B. Burnett, in the northwest corner of Carson county, Texas Panhandle, has opened up the well after having had it shut in for months. It is pumping 157 barrels daily.

South Texas developments pursue the even tenor of Gulf coastal development with the Cow Bayou district of Orange county the most active in testing operations. Drilling operations, however, are to the 4000 foot level, where the Humble Oil & Refining Co.'s Chesson flowed at its maximum around 15,000 barrels daily earlier in the year.

Drilling at Orange is expensive because of the depth to which a test must be put down and the results so far have not been as encouraging as had been at first anticipated.

Link Oil Corp.'s No. 1 Adams, is waiting on orders after getting salt water at 3954 feet; The Sun Co.'s No. 1 Constream made two heads, 50 per cent salt water, at 4040 feet, and is still bailing; Gulf Production Co.'s A-3 Winfree had salt water at 4132 feet, its No. 2 Winfree had salt water at 3525 feet and A-2 Winfree salt water at 4598 feet.

Small end of the week completions in the Mexia pool included U. S.-Tex Oil Corp.'s No. 6 Anderson, 3080 feet,25 barrels; Gulf Production Co.'s No. 1 Sherrer, 3048 feet, swabbing 60 barrels; Humphreys-Mexia Co.'s No. 1 Baker, 3008 feet, 120 barrels and its No. 1 Best, 3041 feet, 115 barrels through tubing.

Rush Construction On Line To Coast

COLUMBUS, O., Feb. 25.—Activity of the Humphreys-Pure Oil Pipe Line Co. is summarized by the Pure Oil Co. here as follows:

Gathering lines from Teague, Texas, northern terminus of the trunk line to the Gulf Coast, have been completed to the Mexia field and 35 miles of the trunk line from Teague to Smith's Bluff, on the Nechez River, south of Beaumont, Tex., has been completed. Work on the pump station at Teague is well advanced. Four construction gangs are at work, but bad weather has materially delayed completion of the line, which is to be 205 miles long.

The Humphreys-Pure Oil Refineries Corp. has begun the construction of six steel 55,000-barrel tanks at Smith's Bluff and the wharf on the Nechez River it to be started soon.

At Marcus Hook, Pa., where the Pure Oil Co. has a refinery, nine 55's have been built, making a total of 17 at that point. A 200-acre site was acquired some time ago, but no storage has as yet been built on this.

Hot Springs, Ark., Test Gets Showing

SHREVEPORT, Feb. 25.—Advices from Malvern, Ark., tell of an interesting prospect in the Taylor Henson well in 16-4-12, Hot Springs county, which at 1376 feet is said to be standing 700 to 800 feet in fluid, about 150 feet being oil, with bailing in progress. Taylor, an ante-bellum negro, started drilling on his farm about six years ago with a makeshift rig and from time to time resumed the work as he was able to raise necessary funds.

The test is 85 miles north of the El Dorado, Ark., field. The chief importance is in the showing, as it is conceded it will not make a well.

Great Eastern Co. To Build Refinery

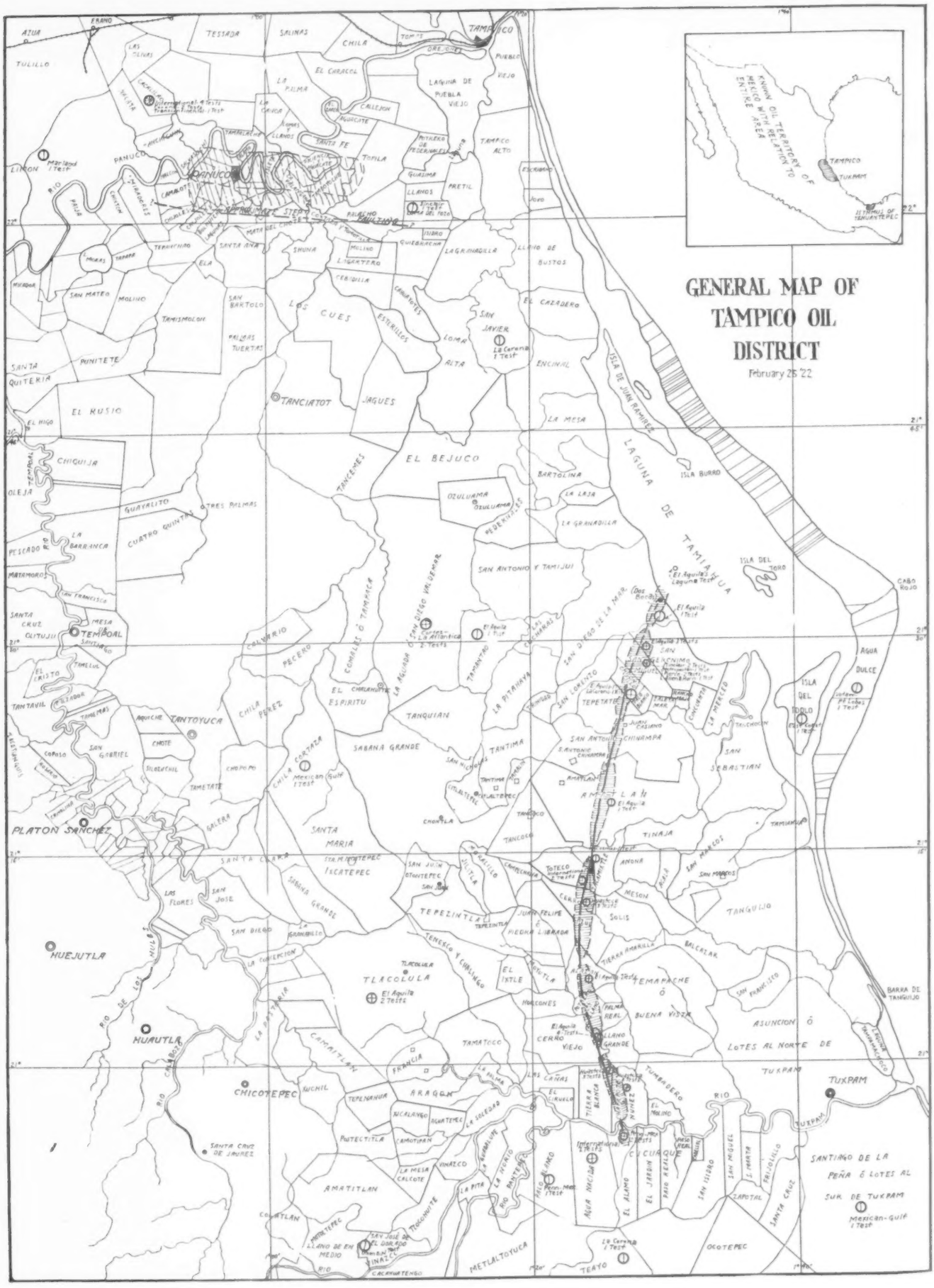
By Special Correspondent

LEXINGTON, KY., Feb. 25.—Another refinery is being added to the list of several that have been constructed in Kentucky in the past few years. This one is to be located near Cattletsburg, Ky., where the Big Sandy River empties into the Ohio and at the junction of Kentucky, West Virginia and Ohio. The plant will have an initial capacity of 1000 barrels per day but is being built with an idea of doubling this capacity within a short time.

The Great Eastern Refining Corp. is constructing this plant, which has a capitalization of $200,000, and is headed by A. J. Dalton, a resident of Huntington, W. Va., and who is interested in coal as well as the production of oil in Kentucky.

A site has been purchased which has both railroad and river advantages, as well as Cumberland Pipe Line delivery and the Independent Berea Pipe Line which has lately been built. Work on this refinery has been started and material and supplies are being received daily, with a view of early completion. It is the plan of the corporation to market the greater portion of its product in the tri-state region at present.

There have been fewer completions in Kentucky during the past week than for any week in four years. This is especially true of wildcat territory. While the winter season has been extremely mild the operators had prepared themselves for a more severe winter and had very little work planned. Indications are however that conditions will be different within the next few weeks, as the operators are now letting contracts for wildcat development.


GENERAL MAP OF TAMPICO OIL DISTRICT
February 25 '22
KNOWN OIL TERRITORY OF MEXICO WITH RELATION TO ENTIRE AREA
TAMPICO
TUXPAM
ITSMUL DE TEHUANTEPEC
TAMPICO
PANUCO
TAMPICO ALTO
LAGUNA DE PUEBLA VIEJO
LA PALMA
EL CHARCOL
CHILA
TESSADA
SALINAS
TULILLO
LAS OLIVAS
ATUA
ERANO
LIMON
PANUCO
RIO PANUCO
SANTA FE
TAMPILA
GUASIMA
LLANOS
PRETIL
ESCOBAS
JOYO
ISIDRO
GUEBRACHA
LAGRIMADILLA
LLANO DE BUSTOS
SMUNA
MOLINO
LIGARTERO
CERBUILLA
CAMALOTES
LOS CUES
ESTERILLOS
SAN JAVIER
LOMA ALTA
EL CAZADERO
ENCINAL
ISLA DE JUAN RAMIREZ
LA MESA
LA LAJA
LA GRANADILLA
BARTOLINA
ISLA BURRO
LAGUNA DE TAMIAHUA
ISLA DEL TORO
CABO ROJO
AGUA DULCE
SAN ANTONIO Y TAMIJUI
OZULUAMA
EL BEJUCO
TANCIATOT
JAGUES
TANCHES
EL RUSIO
EL HIGO
SANTA QUITERIA
PINITETE
SAN MATEO
MOLINO
TAMISMOLON
PALOMAS TUERTAS
SAN BARTOLO
ELA
SANTA ANA
TERRACHINO
MORAS
TAPADA
MIRADOR
CHIQUIJA
OLEJA
GUAYALITO
CUATRO QUINTAS
TRES PALMAS
LA BARRANCA
PESCADO R.
MATAMOROS
SAN FRANCISCO
SANTA CRUZ OLITUJU
MESA TEMPOAL
EL CRISTO
TAMAUL
TANTAVIL
TAMALMAS
AQUICHE
TANTOYUCA
CHOTE
SILOLUCHIL
TAMETATZ
CHOPOPO
SAN GABRIEL
COPOSO
PLATON SANCHEZ
GALERA
CHILA PEREZ
PECERO
COLORADO
CAMALOTES DE TAMPACAN
LA AGUADA O SAN DIEGO VALDEMAR
EL CHARANDITO
ESPIRITU
TANQUIAN
SABANA GRANDE
CHILA CARTAZA
TAMARINDO
LA PITAHAYA
SAN DIEGO DE LA MAR
SAN LORENZO
TEPETATE
SAN ANTONIO CHINAMPA
SAN SEBASTIAN
TANTIMA
SAN NICHOLAS
CHONILA
TANCOLO
AMATLAN
LA H
TINAJA
TAMIAHUA
SANTA MARIA
SANTA CLARA
ISCATEPEC
SAN JUAN OTONTEPEC
JULITLA
ANONA
SAN MARCOS
MESON
TANGUIJO
TEPEZINTLA
JUAN FELIPE
PIEDRA LIBRADA
SOLIS
TENERIA Y CHILIMEO
EL IXTLE
TIERRA AMARILLA
BALCALAR
HUEJUTLA
RIO DE LOS HUICHOLES
LA CONCEPCION
TLACOLULA
TEMAPACHE
HUAUTLA
HUICHOLES
PALMA REAL
BUENA VISTA
ASUNCION
LOTES AL NORTE DE
TAMAICO
CAMAITLAN
FRANCIA
ARAGON
CHICONTEPEC
TUCHIL
TEPENAHUA
NOALAYOCO
SOLATEPEC
LA SOLEDAD
PUTECTITLA
CAMOTIPAN
SANTA CRUZ DE JUAREZ
LA MESA CALCOTE
AMATITLAN
COATLAN
TEPETITLA
LLANO DE EN MEDIO
SAN JOSE DE EL DORADO
TEOCUNITE
RIO CACAHUATENGO
METLALTOYUCA
TEAYO
OCOTEPEC
TUXPAM
RIO TUXPAM
TUMBADERO
EL CIRUELO
TIERRA BLANCA
EL MOLINO
EL JARDIN
EL ALAMO
RANCHO VIEJO
SAN ISIDRO
SAN MIGUEL
ZAPOTAL
SANTA CRUZ
SANTIAGO DE LA PEÑA Ó LOTES AL SUR DE TUXPAM
Mexican-Gulf 1 Test
BARRA DE TANGUIJO

Oil In Sight From Mexico's Known Fields 225 Million Barrels

TAMPICO, Feb. 23

By Paul Wagner
STAFF REPRESENTATIVE

TWO HUNDRED and twenty-five million barrels, in round figures, constitutes the known exploitable resources of the petroleum producing territory south and southwest of Tampico. That total quantity represents more than the amount of crude oil produced in the southern districts and the Panuco territory in the year 1921 by some 25 million barrels. When this shall have been worked out fresh pools will be required to supplant it if the Republic of Mexico is to continue the factor in the oil industry of the Western Hemisphere that it has been for the last two years.

Some 40 per cent of the resources of Mexico that remain in sight is made up of production still to come from the Toteco-Cerro Azul "high spot," near the center of the Southern district "knife edge" fold. On a basis of more than 120 million barrels having been taken out of the Toteco-Cerro Azul and an estimate that this "high spot" contains roughly 80 millions of barrels more oil recoverable, it is upon scattering development elsewhere in the southern district and some 25 million barrels still to come from the known area around Panuco that a basis of 225 million barrels in sight for Mexico is reached.

What the future of oil production from Mexico may be—and the country's total resources are admittedly only scratched—is a question with which this survey does not propose to deal, except possibly in generalities. The purpose to discuss the waning character of known and presently exploitable underground reserves, especially as they may be considered a factor upon domestic crude oil markets.

How long Toteco-Cerro Azul will continue to produce before salt water encroachment puts in its appearance and reduces the pool to a "stripping well" basis is a question that none will attempt to answer. Such a condition, however, is inevitable. In some quarters, its flush life is estimated at three to five months; in others, as long as eight to eleven months is given the pool. Frankly, no one knows how long it will last. But the more conservative operator, basing his judgment upon the amount of oil already taken out and the rate of exploitation pursued, is inclined to feel that somewhere between June and August a "stripping" basis will have been reached on Toteco wells, with the southern part of the Cerro Azul development holding up for an indefinite time longer.

Decline May Affect Crude Prices

A first hand study of production in the lower country (Southern district) shows that a flattening of the production curve insofar as it affects American markets may be expected after the Toteco-Cerro Azul "high spot" has been cut down toward a "stripping" proposition. That effect will result, not so much from a consideration of the exploitable oil remaining in sight as it will from the fact that the known resources left along the Southern district fold are held for the most part by the companies that control. Also, because of the smaller potentialities of individual pools than was the case with Toteco-Cerro Azul, Amatlan and Chinampa. It would appear that instead of 18 million barrels of oil a month coming out of the southern fields for a year that Toteco-Cerro Azul's decline would adjust the out pour to some 10 to 12 million barrels thereafter for 10 to 12 months. Upon such a contingency rests whatever effects Mexico's decline may have upon crude oil prices in the United States.

In the aggregate the amount of oil to be recovered from the working out of the smaller pools is important. As considered from the viewpoint of the individual development the quantities remaining are less of a factor. Already Doheny is taking steps to develop the Tierra Blanca-Chapapote Nunez pool, near the south end of the known fault line, where two producing wells already have been completed. Six additional wells are being drilled or locations have been made.

El Aguila (Mexican Eagle Oil Co., Ltd.) has four tests under way still on the eastline of the Cerro Viejo property, where early in February it brought in a 35,000 barrel well, 11 miles south of Cerro Azul. This is midway between the old Potrero del Llano pool and the Huasteca Petroleum Co. development in Tierra Blanca-Chapapote Nunez. Potrero del Llano recovered its 100 million barrels and "died" in 1918.

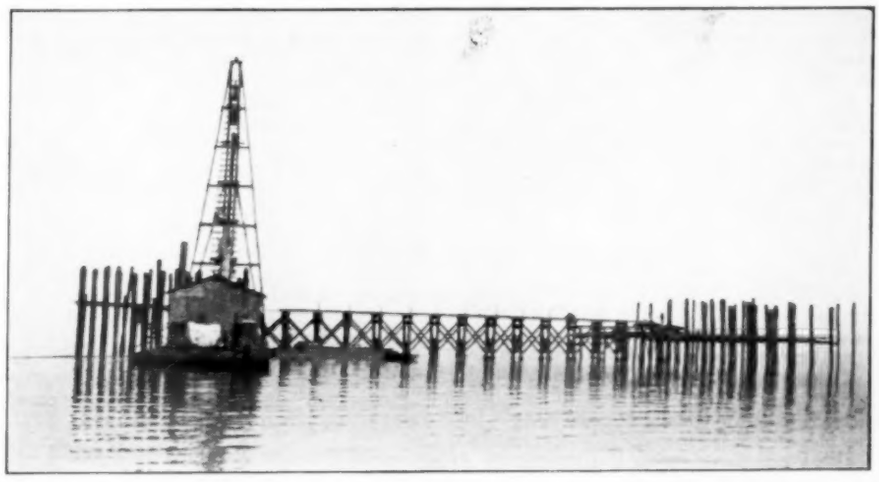
Developing North End of Fold

Additional oil is now known to be recoverable in the territory at the north end of the fold between the drowned out Tepetate pool and the old Dos Bocas well, which latter ran wild in 1908 and from which no marketed production was ever recovered. From Tepetate to Dos Bocas, a distance of roughly 18 miles, oil possibilities had been previously considered ruined by salt water encroachment that resulted in the San Diego well when it first went "wild" and afterwards by the drowning out of Tepetate in 1918.

Recently, however, El Aguila developed heavy oil in a test on San Geronimo and now it is drilling three additional tests. Immediately south of San Geronimo, in Chiconcillo, the direct subsidiary in Mexico of the Royal Dutch-Shell group (La Corona) got a 15,000 barrel well making approximately the same grade of oil, i. e., about 14.7° Be., gravity. This compares with 20 gravity (light oil) elsewhere in the Southern district. Whether the gravity results from proximity of the oil to a "saddle" in the formation, or whether it was influenced by the Dos Bocas-Tepetate salt water conditions is unexplained. It is generally believed, however, to have resulted from one or the other of these causes.

Meantime, between San Geronimo proper and Chiconcillo, six tests are being put down in San Miguel by four interests. Two are by the Sinclair crowd; one by the Pierce Oil Corp. and one by Allen & Horn, Independent operators.

Beyond Dos Bocas, to the northeast, El Aguila is driving piling for a test in the Tamiahua laguna. This test may be expected to give some indication of whether the Southern district fold and fault line, which are not discernible at the surface in the lower country, extend out into the water off Dos Bocas.



Driving piling in Tamiahua Laguna off site of old Dos Bocas well for "El Aguila's" No. 1 Laguna northeast of known production in southern district of Mexico.

Oil in Sight 225,000,000 Bbls.

Such are the possibilities affecting future production in the known area along the Southern district fold. From Dos Bocas south to Alamo, the pools are estimated to contain reserves roughly placed at the following amounts:

Pools	Barrels
San Geronimo-Chiconcillo	50,000,000
Toteco-Cerro Azul	80,000,000
Tierra Blanca-Chapapote Nunez	50,000,000
Alamo	20,000,000
Total Southern District	**200,000,000**
Panuco District	25,000,000
Grand total, known fields	**225,000,000**

In the foregoing table, Cerro Viejo is ignored as promising only nominal production and its final recovery probably to be accounted for in over-estimates of the actual quantities of crude to be taken out of other pools enumerated. El Aguila's 35,000 barrel No. 2 Cerro Viejo had the pay

at 1860 feet, subsea level, as compared with the nearby No. 3, which recently drilled into salt water at 1883 feet.

Unless a higher point is found on this part of the fold, and field authorities consider it doubtful, there is only 23 feet upon which to draw between the salt water table that underlies Southern district oil reservoirs and the level at which the Cerro Viejo oil was found. Immediately north, in the drowned out Potrero del Llano development, the subsea elevation of wells was 1699 feet, or 161 feet higher than the Cerro Viejo pay.

Development Phases Indicated

That the Tierra Blanca-Chapapote Nunez development promises relatively small final recovery in comparison with Toteco-Cerro Azul, Amatlan and Chinampa, is indicated by the subsea level at which the two wells were completed. No. 2, with a surface elevation of 80 feet, and subsea elevation of 2029 feet, was a February completion for the Huasteca Petroleum Co., showing at the start for 1000 barrels of oil and 15 million cubic feet at total depth of 2109 feet. The surface and subsea elevations were not materially different in No. 1, which was completed last May for 35,000 barrels. Relatively small quantities of production were sold from No. 1 in the last months of 1921 to El Aguila but the well remains unexploited at the present time. When finally completed, the No. 2 well is considered good for about the same amount of oil as No. 1. These and other wells to be completed later will be hooked to the Huasteca pipe line now building south from Cerro Azul.

La Corona's completion last week of the Chiconcillo well at the north end of the fold for 15,000 barrels was at subsea level of 2145 feet. Its total depth was 2270 feet. El Aguila's well on San Geronimo was at total depth of 2306 feet and its subsea level was similarly low.

Field engineering features of Southern district developments thus accounted for, the elevations in the Toteco- Cerro Azul pool as compared with the proximity of salt water in Zacamixtle are pertinent to consideration of how much longer that pool will continue to give up crude petroleum before salt water encroachments reduces the area to a "stripping" basis.

Shallowest Wells in Toteco

The shallowest wells (subsea elevations) in Toteco are at 1241, 1243 and 1247 feet, subsea elevations, and the deepest is at 1554 feet. In Zacamixtle, which adjoins Toteco on the north, the salt water level is at approximately 1750 feet, subsea elevation. There is, therefore, more than 500 feet of elevation upon which to draw before the wells located highest on the Toteco structure would be affected by the upward rise of the salt water table from Zacamixtle. The deepest Toteco well, having subsea elevation of 1554 feet, has nearly 200 feet of elevation upon which to draw before water puts in its appearance. This is the well of the Huasteca Petroleum Co., on the Buena Vista pump station site, the farthest north on the Toteco hacienda, where the right of the Doheny interests to drill was disputed by the International Oil Co., and the Mexican Gulf Oil Co., who together control Toteco.

Even after the Buena Vista station site well goth to water, and logically it would be the first to feel encroachment, there would still remain 313 feet of elevation upon which to draw before the highest wells in Toteco are affected by the brine. Huasteca Petroleum Co.'s wells immediately south of the Toteco line, where competitive drilling has been rampant recently, are considered to be properly a part of the Toteco section of the pool notwithstanding they are on the Cerro Azul side.

Cerro Azul Last to Go

Several miles intervene between the Cerro Azul line wells and the original No. 4, toward the south end of the development, which is credited with having given up already more than 75 millions of barrels of oil. No. 4 has subsea elevation of 1352 feet, but because of its isolation from the Toteco-Cerro Azul line wells, field authority credits it with possible production long after production to the northward shall have reached a "stripping" basis. This is based upon the underground conditions in the reservoirs below the Tamasopa lime, which are best described as "cavernous."

An underground reservoir in the Southern district is not unlike a huge oil tank, which would be emptied more quickly accordingly as to how many outgoing lines might be flowing out its contents. The pull from the relatively larger number of wells at the north end would take out the oil from this part of the reservoir more quickly, tending to tilt the water table upwards, whereas with the No. 4 well and the relatively small No. 3 well the only suction against the south end of this part of the pool would remain productive longer.

Therefore, when Toteco-Cerro Azul wells do show salt water it does not mean that quite the same results will appear that were coincident with encroachment in Amatlan and Chinampa. In both the latter fields, which had their rise and fall in the years 1921 and 1920, respectively, myriads of smaller operators drilled scores of wells which brought about the end quickly when salt water appeared. In Toteco, the competition between the Huasteca on the one hand and the Mexican Gulf and the International, on the other, was intense. But even at that, nothing approaching the intensity o f Chinampa and Amatlan operations resulted.

Quantities Possible to Exploit

Facilities do not exist for taking out the exploitable oil from Toteco currently. Mexican Gulf has finished its drilling campaign and notwithstanding it was taking 110,000 barrels daily from Toteco in the week ended Feb. 11, last, its total exploitable oil from 10 wells capable of producing was roughly 400,000 barrels every 24 hours. International Petroleum Co., subsidiary of the Mexican Seaboard of Maine, has three wells still to complete, has five capable of producing exploitable oil totalling nearly 200,000 barrels daily, but it was taking out only 37,600 barrels.

Huasteca Petroleum Co. was taking 28,000 barrels daily from the south end of Cerro Azul, so that of a total of 226,000 barrels being exploited, 198,000 barrels was coming from line wells across the boundary from the Mexican Gulf and International production. As against total production for all interests being taken from Toteco-Cerro Azul the last week of December of 521,000 barrels daily, the February 11 figures accounted for 373,600 barrels daily. Possible exploitable production however, was materially greater as of the later date.

Notwithstanding denials of agreements reached for holding back exploitation of oil from this pool, disinterested operators have pointed to the lessened production taken out as confirming such a policy. Substantiation of denials, however, is indicated by the fact that Doheny's exploitation, Feb. 11, was only a few thousand barrels less than it has been at any time for two or three months, whereas the lessened taking out of oil has been from the International and the Mexican Gulf wells, especially the former.

These facts set forth, the reader must form his own opinion upon the length of time before Toteco and Cerro Azul go the way of other salt water pools. Reports of small percentages of water previously said to have shown represented only moisture in the oil. Material sloughing off of this production when it does come, however, will leave most of the remaining known production in the hands of two interests, i. e., Doheny, who must offset reserves to what extent he can with Tierra Blanca-Chapapote Nunez; and El Aguila, arm of the Royal Dutch-Shell group, whose oil goes into the world markets and which does not come into domestic competition in America with crude from the fields of the United States.

Old well of American Fuel Oil Co. in Loma del Pozo, drilled years ago southeast of Topila, which came in as a big gasser at 2,875 feet, creating ice on the casing the year around.

"Wildcatting" Under Way

Fifteen separate spots in the general Tampico area are being "wildcatted" however, at the present time. Twelve of these are properly described as being in the Southern district. Three of them are more properly identified with the Panuco territory. In some cases, two or more tests are being put down, so a total of 23 tests in all are identified with the 15 operations. The 14 tests in 12 localities in the Southern district are outlying, north, south and west from the known field, which is considered to extend 60 miles south from Dos Bocas to Alamo. The nine tests of five interests in three territories around Panuco are east, north and west.

Except at Panuco, the finding of oil in any of these tests would mean either the opening up of a field entirely distinct from producing conditions already existing, or it would mean stumbling onto a duplication elsewhere of the faulting and folding conditions from which roundly 98 per cent of the oil taken out of Mexico has come in the past.

New Fields Possible Any Time

That this faulting and folding has been along lines so unusual that it is considered not to be easily duplicated does not prevent exploratory work actually duplicating such a condition again. Generally speaking,

such duplication must come after tireless "wildcatting," expensive exploration and failure upon failure before success is attained. There is always before the industry, however, the possibility that success will be attained at any time. And with 225 millions of barrels of oil in sight in the general Tampico district, a year or more remains for "wildcatting" to possibly replace the remaining known and waning exploitable reserves before they are actually gone.

Either the Marland Oil Co., of Mexico, S. A., test on the Limon hacienda may extend the Panuco district to the west, or the Sinclair test on Lomo del Pozo may carry it eastward beyond Topila. Important seepages exist on Limon and Marland geologists are credited with having discovered in the foothills 45 miles west of Panuco surface indications of the step-faulting that drilling operations established to exist as a producing factor on an east to west line south of the known fields.

In Lomo del Pozo, the old American Fuel Oil Co. test years ago developed heavy gas around 2800 feet and the ice it causes to form on the casing at the present time makes the site of the well one of the interesting spots outlying from the producing fields. Test wells in Cacalillao, northwest of the Salvasuchi section of Panuco and towards Ebano, would materially increase production from this district should they develop oil. But aside from what the Loma del Pozo and the Limon tests prove the others may be generally regarded as calculated to keep Panuco production normal at 125,000 to 150,000 barrels daily.

Southern District Prospects

In the southern district, any of the "wildcat" tests spotted on an accompanying map would mean the opening up of entirely new development. El Aguila's No. 1 Tamiahua, in the Laguna, has possibilities of extending the Southern district productive fold to the northeast and at the south it is not impossible that the Penn-Mex Oil Co.'s Alamo production might be carried further south than the bend of the river where all the producing wells were drilled. Attempts to extend Alamo production to the south, however, have failed and generally it is believed that the specific structure south from Dos Bocas fags out at a point near the Tuxpam river.

South and southwest of Tuxpam, however, seepages are taken as evidence of other oil to be found by "wildcatting," and in some cases structure is believed to have been identified. Tests that are only now starting, however, may be considered to be important for the longer pull consideration than presently for the reason that some of them, such for instance as those on San Jose El Dorado, Chila Cortaza and Tlacolula would require perhaps a year or more to complete from the time of spudding in on the test; and once completed as a producing well it is not improbable another year or more would be required to build in to the territory the pipeline transportation facilities necessary to flow oil out into the world's markets.

Since the producing area along the Southern district fold is roughly 20 to 25 miles inland from the Gulf Coast, and millions upon millions of dollars have been spent in finding the oil, to say nothing of the added expense of getting it out into the world's markets) a glance at the accompanying map will give an idea of the stupendous task ahead to replace the waning production of the present. Added to the financial requirements, and many of the operating companies have slowed down because the investment is so onerous, are the general economic and political phases encountered, especially as these phases deal with affairs peculiar to Mexico itself.

Wildcat tests under way in Mexico, in the territory outlying from Southern district production, are as follows:

Tlacolula.—El Aguila, No. 6, crooked hole at 1530 feet; No. 5, derrick.

Tamantao.—El Aguila, No. 1, changing to standard tools at 3445 feet.

Castillo de Teayo.—La Corona, waiting on permit.

San Javier.—La Corona, drilling at 1250 feet.

Agua Nacida.—International Petroleum Co., No. 1 spudded in; No. 2, hauling material.

Chila Cortaza.—Mexican Gulf Oil Co., hauling material.

Santiago de la Pena.—Mexican Gulf Oil Co., clearing road.

Palo Blanco.—Penn-Mex Fuel Co., location.

San Jose El Dorado.—Union Oil Co., shut down at 1250 feet.

Aguada.—Cortez-La Atlantica, No. 1, drilling with "diamond outfit" at 1054 feet; No. 2, location.

Idolo Island.—East Coast Oil Co., of Mexico, S. A., shut down.

Agua Dulce. — Votaw-Port Lobos Oil Co., location.

Tests along the Southern district fold, which are going ahead for the purpose of drilling up old territory or developing oil that may have lodged in crevices high in the formations adjacent to pools that went to salt water, include:

El Aguila.—Amatlan, 1; Alazan, 2; Cerro Viejo, 4; San Geronimo, 1; San Diego, 1; Chiconcillo, 1; Laguna, 1.

Allen & Horn.—San Miguel 1.

La Corona.—Chiconcillo 1.

Cosmos.—Zacamixtle 1.

Sinclair.—San Miguel 2.

Huasteca.—Buena Vista (Toteco) 1; Cerro Azul 3; Tres Hermanas (not mapped) 1; Tierra Blanca-Chapapote Nunez 6.

International.—Toteco 3.

Metropolitan.—San Miguel 2; Cocuite (not mapped) 1.

Penn-Mex.—Alamo 2.

"Wildcats" Northwest of Panuco

In the Panuco territory (heavy oil district), three miles west of the Salvasuchi section, La Corona is rigging standard tools for No. 1 Cacalillao on Fraction 3, lot 4; No. 2, Fraction 1, lot 1, is two and one-half miles north of Salvasuchi,, and No. 3, Fraction 5, lot 1, is a location five miles north of the Alamo bend in the Panuco river, about the same distance from Salvasuchi as No. 2.

International Petroleum Co.'s three tests in lot 5, Cacalillao, are approximately nine miles northwest of Salvasuchi, along the north line of the lot. Locations have been made and road construction is under way. Another international location in Cacalillao, is in lot 4, about five miles west of Salvasuchi. Transcontinental Petroleum Co. (Standard of New Jersey) is ready to spud in on No. 1 Cacalillao, eight miles northwest of Salvasuchi, in Fraction 5, lot 4, close to the Dominguez ranch.

Storm Delays Field Work

Staff Special

TULSA, Feb. 28.—A severe snow storm accompanied by a high north wind descended upon Oklahoma last night and is continuing today. Field work of all kinds will be greatly retarded by the severity of the weather and the condition of roads, many of which in the oil country are becoming impassable. The snow will be as good as a rain for those operators whose wells have been shut down on account of lack of water and this problem will thus be solved for them. This is Oklahoma's first real winter weather and colder temperatures are predicted.

Connect Trucks To Get Through Snow

By Special Correspondent

WINNETT, MONT., Feb. 24.—Oil companies are running loaded trucks in pairs to the Cat Creek oil field, Fergus county, central Montana, in order to successfully buck the big snow drifts. About 10 feet of three-inch tubing is used to connect up the trucks. This push and pull combination has proved comparatively successful in getting supplies and material into the field.

A test drilling in the Buffalo Dome is reported to have found gas at 800 feet in the Amsden formation. The test is to be continued deeper.

The first half of February showed a total shipment of crude from Winnett by rail of 73,000 barrels or about 316 car loads. This would bring the total production for the field for the month up to more than 140,000 barrels or approximately 5000 barrels daily.

The Weowna Refining Co. at Winnett is installing two more steam stills which brings the plant charging capacity up to 1000 barrels. Installation of a 50 horsepower boiler has been completed recently by this company.

The Havre Natural Gas Co. has paid its first dividend which amounted to eight per cent or equivalent to about one per cent a year on the investment. This company started in 1914. In hopes of bringing in a new gas field, the company plans to continue drilling operations.

Obregon Officially Decrees Cut In Tax

Staff Special

TAMPICO, MEXICO, Feb. 23.—Official publication in the Diaro Official at Mexico City confirms the previously published report of President Obregon's attitude in reducing the export taxes under the decree of June 7, last, to approximately 40 per cent. As originally specified light crude from Mexico took a tax under this specific decree of 19.873 U. S. cents per barrel, and other grades correspondingly. This was in addition to the taxation under the decree of May 24, 1921.

Drilling Third Test In Eastern Nevada

By Special Correspondent

FALLON, NEV., Feb. 24.—The Illipah Petroleum Co. is drilling approximately 35 miles west of the town of Ely in White Pine county, Nevada, it being the third test of this company. The two first holes put down by this company are said to have had showings of oil and gas. The first test was lost at 982 feet, while the second was junked at about 502 feet. This third test is down to a depth of 700 feet.

Lack of funds or unfavorable weather conditions has forced practically all of the 12 or more tests in Churchill county to shut down. These tests are in what is known as the Fallon district.

15 Wildcat Wells In Panuco Region

Staff Special

PANUCO, V. C., Mexico, Feb. 22.—Operations within the bounds of the Panuco district at the present time total 94 wells drilling, rigging up or definite locations. Fifteen additional "wildcat" tests bring up the total to 109 operations under way or contemplated. In "inside" territory, where development follows closely the eccentric turns in the Panuco river, the average cost of completing a well is about $35,000 under contract, and in some cases a lower minimum may be obtained. In the case of the "wildcats," however, the cost is considerably greater.

Production, which for months has swung between 125,000 and 150,000 barrels daily, may be expected to continue around this level for some time to come. At this stage of Panuco development, it is usual for new wells to come in for 3000 to 10,000 barrels, initial production, give up their quota of oil in from four to five months and their loss be offset by new completions elsewhere in the general territory.

Oil at the wells is being contracted generally around 30 cents a barrel. One or two companies maintain pipelines from the field to terminals down the river and above Tampico, but for the most part the crude moves from the wells through field lines to Panuco river terminals and is then transported down stream by barges, some of which the operating companies own themselves and some of which are operated for hire by Independent transportation agencies.

A division of Panuco operations shows that wells actually drilling in the division proper at the present time total 21: there are 17 rigging up; 8 derricks and 31 definite locations. Under Topila, Palangana and Pacienciay Aguacate, there are nine drilling, two rigging up, one derrick and five locations. Then there are one "wildcat" actually drilling, five rigging up and nine definite locations. The more important Panuco district "wildcats" are referred to in detail in another article dealing with exploratory work in the general Tampico territory.

Doherty Proves Maguabes Property

Among the important recent developments within the known area is a test completed several weeks ago by the Gulf Coast Corp. (Henry L. Doherty & Co.) on the Sobrevilla tract, in the area mapped as East Maguabes. This is immediately across the old hacienda boundary from Potrero de Isleta and is southwest of the Devil's Elbow (Lomas Llanos) section of the field. The well showed for some 5000 to 10,000 barrels, initial production, but afterwards developed "bolshevik" tendencies.

After producing oil part of a day it began blowing heavy gas and continued to do so until it had been cleaned out again. Then it made oil at a similar rate of production daily to what it had at first. Again the oil flow turned to gas and the well is being worked on to turn it into a petroleum producer.

The field explanation is made that the drill probably penetrated close to a crevice; that after flowing a short time, the hole caves off the oil and that only the gas escapes. When finally completed it is expected to be an average large well.

In Palangana, two miles east of Devil's Elbow in the Panuco district, there are now four wells producing that are capable of giving up together, 35,000 barrels daily, field rating. A half dozen others are under way a stone's throw from them. One, the Ita-Mex Co's. No. 1 Maza, rated at 4,000 barrels, has never been flowed. The others are the National Oil Co's. No. 1 Azuara, 6000 barrels, and the U. S. Mex Oil Corp's. Nos. 1 and 2 Azuara, rated at 10,000 and 15,000 barrels, respectively. East Coast Oil Co's. No. 303, completed for 4,000 barrels, went to salt water almost immediately and was closed in.

Seven Palangana tests are drilling and three additional are rigging up. These with the five completions already made constitute a total of 15, all within a stone's throw of each other with the exception of the Ita-Mex producer, which is perhaps twice that distance to the south.

Drilling North of Palangana

Immediately north and across the river from Palangana, two tests are drilling in Paciencia y Aguacate; one is rigged up waiting on permit and another is a derrick. In Santa Fe, about a mile and a half due north of Palangana, the Mexican Fuel Co. (Pierce Oil Corp.) has derrick up for a test.

At Devils's Elbow, on an eccentric curve Paciencia y Aguacate, there are now four producing wells; 10 drilling; rotaries being rigged up on 3 tests and 2 derricks. The R. Thomas et al well, which came in several months ago; was closed in and later was believed to have been ruined by salt water which appeared when it was opened up, is now rated at 6000 barrels daily, pinched down. It was completed at 2355 feet. Panuco-Boston Oil Co.'s No. 2 Head-Silva, 2245 feet, is a 2000 barrel well and Jones & Buchanan's No. 1 is a 2000 barrel well at 2257 feet. The latest completion is that of Bragdon & Co., on the Hernandez lease of the Panuco-Boston, which came in at 2040 feet and is estimated as high as 5000 barrels.

Okfuskee County Test Flowing 500 Barrels

Staff Special

TULSA, Feb. 25.—At two feet in the sand encountered at 3111 feet, the wildcat test of the Mid-West & Gulf Oil Corp., which has caused so much talk and speculation as to its actual merits as a well, is now flowing 500 barrels every 24 hours and making a flow about every 30 minutes. The Sinclair Crude Oil Purchasing Co. is now building a 4-inch line to care for the production of this well, and providing additional tankage at the well to care for its output pending the completion of the line, which will require from 6 to 8 days. The depth as given above is by steel-line measurement to the top of the sand, although the log of the well, as published in these columns recently, showed the top at 3122 feet.

Upon completion of the pipe line facilities, the well will be drilled on into the sand and completed, but until that time nothing further will be done.

The location of this well is as follows:—center of the N½ of the S½ of the SE¼ of the SE¼ of Sec 2-10-9, Okfuskee county, about six miles south of the town of Okemah, and it is a real wildcat, being 12 miles west of the nearest production, which is that in the famous Township 11 Range 11 country.

Drilling Second Test In Mountain County

Staff Special

PITTSBURGH, Feb. 25.—For more than two years the Peoples Natural Gas Co. of Pittsburg has been trying to complete a deep well on the Seger Bros'. farm, located on the top of Chestnut Ridge, Westmoreland county, Pa. Many obstacles have been encountered and overcome since the well was started. It has now reached a depth of 5,200 feet but must go more than 1,600 feet deeper before it reaches the depth

Well No. 2, Seger Brothers' Farm.

at which the first well, located three-fourths of a mile southeast, encountered gas.

Unfortunately the tubing was stuck in this latter test and parted and is still in the well with an accumulation of cavings on top. Through this obstruction the well is still producing 300,000 cubic feet of gas each day from a total depth of 6,822 feet.

Pipe Line Co. Cuts Price At El Dorado

By Special Correspondent

SHREVEPORT, Feb. 25.—A cut of 25 cents per barrel in El Dorado crude is represented in the following notice posted this week by the Shreveport-El Dorado Pipe Line Co., Inc.:

"On account of continued low prices on refined products, it is necessary, in order for us to move the volume of oil which we have been handling from El Dorado, to establish the following prices, effective February 27:

34 gravity and above	$1.75
32 to 33.9 gravity	1.50
30 to 31.9 gravity	1.25"

Upholds Locations On Kern Co. Claims

By Special Correspondent

LOS ANGELES, Feb. 22.—The United States Court of Appeals has upheld the validity of what are locally known as the McMurtry locations in 32-31-23, Kern county, and thus affirming the judgment of Judge Bean of the United States District Court. The decision affirms titles to three quarters of the section (the southwest quarter is patented) claimed by the Associated, California Midway, Buick and Alaka Pioneer Oil companies and which claims the government to deny on the contention that L. B. McMurtry, the original locator, had used the names of dummies to make up the needed number of co-locators. The co-locators denied that they were dummies, but claimed they were deceived into accepting small sums from McMurtry for locations made in good faith and had sued McMurtry for their share of what he received for the claims from the present owners. Judge Bean decided that McMurtry did not defraud the government and that the locators all acted in good faith.

The late decision is of great importance not only to the companies immediately interested, but also to many others who now hold other locations made by McMurtry, and whose claim to title is being fought by the government. Some of these claims have been compromised by the acceptance of leases.

San Juan County, Utah, Will Soon Get Test

By Special Correspondent

SALT LAKE CITY, UTAH, Feb. 24.—The Monumental Oil Co. expects to start a test soon south of the San Juan river in San Juan county and probably on Township 42 south, Range 42 east. Material is being moved to this area. This is on what is known as the Hulkito structure. The Hanaker sand may be found at about 1850 feet. The company is reported as controlling 12,500 acres.

There is a report current that the Franco-Utah Oil Co., recently organized under the laws of Delaware, has taken permits over on about 50,000 acres in this state, and that a portion of it is on shale prospects. Officers of the company are leading business men in this state, France, Belgium, and of New York City.

Ohio, West Virginia, Each Get Good Well

By Special Correspondent

PARKERSBURG, W. VA., Feb. 25—Events of importance were hard to find in the eastern fields this past week. Small pumpers, of such size and location as to be no sensation at all, were completed in goodly number, but that was about all.

The best southeastern Ohio afforded was the Edward H. Everett Co.'s No. 2 on the Shrider-Albyn farm in Hanover township of Licking county. It produced slightly better than 55 barrels the first 24 hours after a shot in the Clinton sand.

In West Virginia, the Pure Oil Co. completed No. 215 on the Williams Coal Co. tract in the Berea Grit for an estimated 350 barrels initial. The only thing remarkable about this is its size, which is considerably better than the general run of wells in this famous Cabin Creek pool. In the same general area, and in Sherman district of Boone county, Lang & Lawrence have a small well in their wildcat on the Cooper farm on Coal River. This is also a Berea well, but is considered too far off structure to hold encouragement for further development.

The balance of them, as mentioned previously, were small pumpers and inside completions.

Kentucky Production Shows January Loss

LEXINGTON, KY., Feb. 25.—Production in all the Kentucky counties in January, as compiled by E. E. Loomis, secretary of the Kentucky Oil Men's Association, shows a loss of about 38,000 barrels, as compared with the December output. The report, with December figures, is as follows:

County	Jan.	Dec.
Allen	39,078.58	44,008.56
Barren		2,874.34
Bath	1,481.27	2,386.28
Boyd		166.37
Estill	53,786.44	66,124.46
Floyd	331.99	261.20
Jackson		167.56
Johnson	39,713.30	39,873.09
Knott	169.01	157.14
Lawrence	29,887.76	31,646.59
Lee	297,869.91	313,765.79
Martin		210.64
Magoffin	79,302.67	80,203.80
Menifee	1,592.94	1,978.89
Morgan	636.93	1,042.30
McCreary	525.02	604.97
Powell	15,316.29	21,640.44
Simpson		8,054.32
Warren	104,508.77	85,439.79
Wayne	18,276.76	18,680.90
Whitley		293.84
Wolfe	7,253.70	8,254.34
Total	**689,731.34**	**727,835.61**

Another Big Gasser In N. W. New Mexico

AZTEC, N. M., Feb. 24.—The No. 2 well of the Aztec Oil Syndicate, located half a mile from Aztec, San Juan county, New Mexico, has been completed with an open flow estimated at eight million cubic feet, which is three million cubic feet greater than the No. 1 gasser. The big flow came at 1000 feet. The community of Aztec can readily be supplied with the production from these two gassers, it is beliveed.

HOUSTON, March 2.—R. J. Brown, St. Louis, head of the R. J. Brown Oil Co. who left Houston early in the week after a business visit, reports slow but steady increase in demand for petroleum products. He is optimistic of conditions over the spring and summer periods.

Expect Development In Huron County, O.

By Special Correspondent

FINDLAY, Feb. 27.—Completions were scarce in the Lima field this week, but other sections of the Central West showed some promising developments.

Leasing of territory in Huron county is going on at a rate that would indicate intention to drill over this area rather extensively. A test well is being drilled on the farm of Anthony Boose near Noughtonville in Ripley township, The Suter Oil & Gas Co. has just leased approximately 600 acrees in Wakeman township.

The best well of the week in the Lima field was a 5-barrel well in Marian township, Allen county, drilled in by Maire Brothers and others.

A well reported to be making 30 barrels daily has been obtained in Pike township, Jay county, Indiana by the Bayer Oil Co. The well is about 15 miles from previous production. The company is now drilling two other wells in the same locality. The sand was found at 1018 feet and the well finished at 1049 feet.

A 50-barrel well was completed by the American Oil & Development Co. in Parker township, Clark county, Illinois. The Petro Oil & Gas Co. has completed another well in the Centralia field that compares favorably with the other wells that have just been drilled in this section.

Jenks Field May Get Deepening Campaign

Staff Special

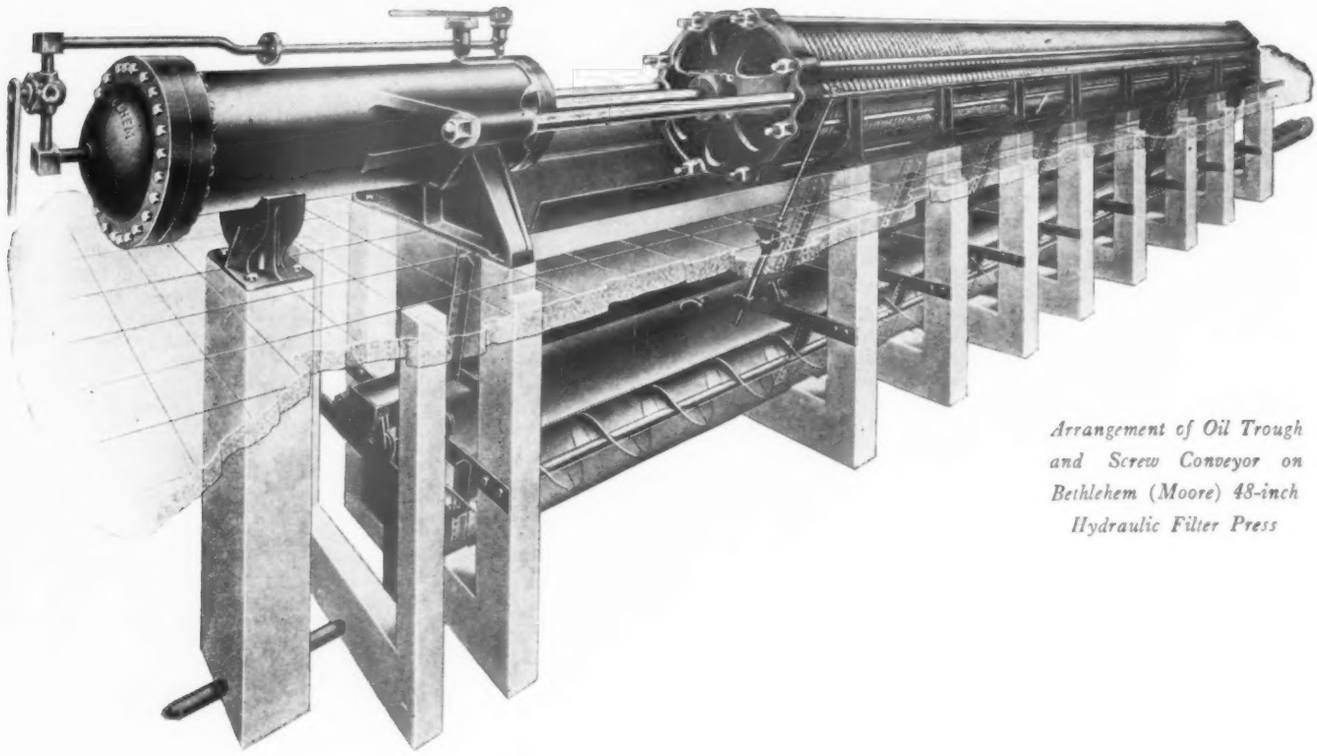
TULSA, Feb. 25.—The well of O. N. West, et al., located in the southwest corner of the SW¼ of 1-18-12, Tulsa county, about three miles north of the town of Jenks, found the Wilcox sand or the second break in the lime, and after a shot of 60 quarts from 2140 to 2152 feet, is flowing 35 barrels daily through the six-inch casing.

The successful completion of this well will no doubt result in considerable activity in the vicinity, as it is situated in a locality which has been producing oil for many years from shallower sands, being in the northeast extension of the old Glenn Pool. Several sands have been productive in this district, the most important being Red Fork, Glenn and Taneha, the Red Fork sand occurring at about 1100 feet, the Glenn at 1750 and the Taneha at 1900.

West et al. have made a location for their No. 2 on the same farm, and the Gladys-Belle Oil Co. is rigging up to offset, north of No. 1.

HOUSTON, March 2.—S. E. Lane, sales manager of the Galena Signal Oil Co., of Texas, has returned to headquarters in New York City after 10 days at the Houston office. Mr. Lane formerly was located at Houston but moved to New York City some time ago, the Houston offices since then being in charge of E. M. Armsby.

It's a good idea to read the classified advertising carried under the heading "Oil Industry Exchange," near the back cover of this or any other issue of National Petroleum News.



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MOORE WAX PLANT EQUIPMENT

Commissioner Defines Highest Posted Price

Staff Special

TULSA, Feb. 25.—In a letter to J. George Wright, superintendent of the Osage Agency, Pawhuska, Charles H. Burke, commissioner of Indian Affairs at Washington has made a ruling as to the much-discussed question of what constitutes the "highest posted market price" of crude in the Mid-Continent field, which has been the basis of royalty payments in the Osage under Section 2 of the lease form prescribed for use in that reservation. The commissioner's ruling comes as a result of a hearing before him on Jan. 19, 1922, when a committee of the Osage Oil and Gas Lessees' Association urged that the present regulations be modified so as to recognize by the term "Mid- Continent field" only the territory included under that designation at the time the leases were made, namely, Oklahoma and Kansas; and that the term "highest posted market price" should be so construed as to mean the highest price at which oil was selling generally, which producers could obtain in open market from companies taking oil from producers offering it for sale, this as distinguished from a price posted by some local refineries, which had pipe lines in the oil fields to supply their own needs, and which at times paid in excess of the regular posted price in order to acquire a sufficient amount of crude.

With reference to the definition of the term "Mid-Continent field," Commissioner Burke rules as follows:—"It seems to me only fair and reasonable that the term "Mid-Continent oil field" shall be construed to mean the territory embraced in that field at the time the lease form and regulations were adopted, and you are hereby notified that such construction will be followed hereafter."

In the matter of the highest posted market price, the commissioner, after reviewing the arguments put before him by the committee, makes the following decision on the subject:—"You are therefore authorized hereafter in construing the term 'highest posted market price in the Mid-Continent field' to construe it as the highest price posted by a purchasing company taking a substantial portion of the oil in the territory it is serving in Oklahoma or Kansas as distinguished from a company taking its oil mainly from companies with which it is affiliated, and from lessees producing a certain grade of oil, or which purchases only a small portion of the oil in the territory it is serving."

In line with this ruling, the commissioner decided that during the period from Oct. 3 to Oct. 7, during which time confusion arose as to what was the regular posted market price, the royalty should be paid upon the basis of $1.25 per barrel, at which date the increase from $1.25 to $1.50 became general, although a few companies had been paying the higher price for several days prior thereto.

Where oil averages 38 gravity or better, as in the Burbank pool, the price of $2.25 per barrel, as posted by the Gulf Pipe Line Co. will be considered the basis upon which royalty shall be paid.

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Investigations - Reports - Designs - Specifications

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By William Harvey Emmons

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NATIONAL PETROLEUM NEWS
800 Caxton Building Cleveland Ohio

Former Head Of Caddo Levee Board Is Dead

By Special Correspondent

SHREVEPORT, Feb. 25.—William F. Taylor, aged 65, prominent wholesale grocer, cotton, oil man, and plantation owner, died at his home here yesterday, after an extended illness. Aside from his extensive private affairs, Mr. Taylor devoted much time, before ill health caused him to retire, to public matters and thrice he was president of the Caddo Levee Board, which has been among the largest royalty recipients in the Caddo oil fields.

Although confined to his home due to illness, Mr. Taylor was consulted and is said to have been largely responsible for the favorable settlement of litigation involving title to lake beds containing many oil wells yielding the levee board rich royalty. The state and the levee board was engaged in this controversy, from whose settlement about one million dollars was saved the board for completing important drainage and levee projects.

* * *

TULSA, Feb. 25.—Robert M. Blackmore, secretary and treasurer of the Great American Refining Co., with headquarters here and operating a plant at Jennings, died of heart failure at the Jefferson hotel at St. Louis on Thursday at 8:30 p. m., according to information received at the offices of the company here. Mr. Blackmore was on a business trip at the time of his death. He was accompanied by his wife and daughter.

Funeral services were to be held at Kokomo, Ind., on Sunday afternoon at 3 o'clock. The body was shipped to his former home there for interment.

Mr. Blackmore was 49 years of age. He has been connected with the Great American Refining Co., for six years. He was born at Madison, Ind. In addition to his widow and daughter Mr. Blackmore is survived by a son and brother and sister.

Amity Gasoline Co.'s Superintendent Dies

Staff Special

BARTLESVILLE, Feb. 24.—F. M. Walker, aged 39, general superintendent of the Amity Gasoline Co. died at his home here at 4:20 o'clock Wednesday morning. He was stricken with pneumonia a week before his death.

Short funeral services were held at the Walker home at 3 o'clock Thursday afternoon, after which the body was shipped to Pittsburgh, his old home, for interment. Learning that Mr. Walker was seriously ill his mother and sister started from Pennsylvania to be with him. They arrived in Bartlesville Wednesday morning after he had died.

Mr. Walker came to Oklahoma about two years ago to take charge of the plant of the Amity company. He was a member of the executive committee of the Association of Natural Gasoline Manufacturers at the time of his death. He is survived by a widow, a six year old daughter and his mother and a brother and sister.

Truck Driver Killed In Northwest Wyoming

By Special Correspondent

CASPER, WYO., Feb. 24.—Charles Wilcox, age 35, who has been in the employ of the Ohio Oil Co., for the last six years, was found dead beneath a truck loaded with material beside the road running between Cody and Meeteesee in northwestern Wyoming. Wilcox had been out of the hospital only a few weeks as a result of injuries received last May when the bunkhouse in which he was living at Grass Creek was blown up and Harry Foight killed. Wilcox was blown about 100 feet and suffered severe injuries.

Bert Lampitt, who was accused of blowing up the bunk houses, since has been found guilty and sentenced to serve a life term in the state penitentiary.

Wilcox was on his way from Cody to the Grass Creek field, Hot Springs county, when the truck apparently skidded and turned turtle, as he was taking a sharp curve. He is survived by a widow and two small children at his home in Thermopolis.

A. N. G. M. Meets In April

TULSA, Feb. 25.—The first annual convention of the Association of Natural Gasoline Manufacturers will be held at Tulsa during the last week in April, according to the decision of the executive committee of the organization. Exact dates of the convention will be fixed in the near future. W. M. Welch, president of the association, is to name committees on program and arrangements for the convention.

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Lumber Hardware

Stirring Days And Thrilling Nights Customary in Old Bradford

By D. A. Dennison
SPECIAL CORRESPONDENT

Mr. Dennison, a veteran editor of oil industry journals, herewith submits another article about the old days in Bradford and other Pennsylvania oil towns and fields. In this one he tells of some of the troubles and pleasures and pastimes of the pioneer oil men with whom he was in personal contact. —Editor.

BRADFORD, PA., Feb. 23

JOB MOSES, pioneer operator in the Bradford oil field, struck the pay at a shallow depth, in 1864, near Limestone, N. Y., a tannery town in the Tuna valley five miles from Bradford in the direction of the Allegheny river. It is said that Moses did his drilling owing to a Spiritualistic "urge." The oil was not of high quality and there was very little of it in his original wells. Nothing of local oil importance developed until 1875 when paying wells were drilled in the vicinity of Bradford, including the Crocker well, bored to a depth of 1,900 feet, on the Watkins farm. This well flowed 170 barrels daily. Then the Bradford oil field acquired a permanent place in petroleum history. Oil at the time was cheap—the chief product of the fluid being kerosene. Natural gas was wasted. Gasoline was regarded simply as a dangerous fluid. There were no automobiles, motor boats or airplanes to consume it.

But the rush of fortune-seekers from the older oil regions of Pennsylvania immediately set in and within a few years Bradford became a thriving city of the third class and within a radius of 20 miles were more than a dozen smaller oil towns. Narrow gauge railroads were constructed over the hills and through the valleys and their trains were heavily laden with oil well material and passengers. It was not long before the production so far exceeded the demand that local pipe lines which had been hurriedly laid following the opening of the boom, were unequal to the task of moving the oil. Then came a period in which tanks overflowed and producers organized for protection of their interests.

Conditions were somewhat improved in the early '80s when the Standard Oil Co.'s seaboard pipe line was completed and Bradford oil was given a needed outlet. Meanwhile the Tide Water line to Williamsport helped to reduce the surplus accumulations of oil in the lower fields. From Williamsport the oil was shipped by rail eastward.

Oil Exchanges Established

Oil exchanges established in different towns of the Pennsylvania petroleum districts, played with the speculative fractions but were of no advantage in the movement for higher prices. In the price schedules the dollar mark was a pivot for a greater part of the time during Bradford's early development. Sometimes that figure was exceeded and then the indicators at the exchanges showed the price below a dollar. In June, 1878, an oil writer showed, by careful estimates, that operators in the field were daily putting into the ground about $22,000 more than they were taking out. The Producers Protective Association was formed that year. This organization functioned in Pennsylvania as the Mid-Continent Oil & Gas Association now does in Oklahoma and Kansas. It accomplished good results in many directions, but no organization could force up prices to a proper level, or where producers desired them to be. There were the usual demands for shut-downs in operations, but nothing of importance occurred in that line until November, 1887, when oil was selling at 73 cents a barrel.

Passage of "free pipe line" legislation in Pennsylvania was one result of persistent agitation of oil men's rights and the Independents obtained other desired objects by similar effort. The United States Pipe Line, subsidiary to the Pure Oil Co., was an Independent enterprise, the line extending to Marcas Hook near Philadelphia. Bradford men had much to do with this undertaking, Senator Lewis Emery being the principal promoter.

Bradford "Carries On"

During the dozen years of Bradford's boom period, even if prices were unsatisfactory, the town "carried on." The oil tool shops were usually busy. The hotels were well patronized. Merchants prospered and the population increased. Then came the Richburg-Bolivar excitement in Alleghany county, New York, and the gusher discoveries in the Cherry Grove district, Warren county, Pennsylvania. Thereafter Bradford's growth underwent a setback.

One peculiarity always noticeable here is the liberal attitude of the people toward "personal liberty" matters. Originally a lumber center, the old-timers had no use for blue laws. The same spirit prevailed when the oil came. In the halcyon boom days—and nights—the oil fraternity had ample opportunities for driving away dull care. There were dozens of drink emporiums and gambling establishments were numerous. Red lights burned in various parts of the "oil metropolis"—as local news writers delighted to designate it.

Two vaudeville houses catered to lovers of the song and dance. The Wagner Opera House provided high class attractions—among its histrionic drawing cards being such artists as Booth, Barrett, Modjeska, Billy Scanlon, Sol Smith Russell, Mrs. Langtry, and many others. One of the shining stars of the old Gem Theater was Louise Montague, "Barnum's $10,000 Beauty." In this theater, a tank builder employed up the West Branch, broke into professional vaudeville. He was Frank McNish, the "Silence and Fun" man, afterwards of the Johnson, Shavin & McNish Minstrels. Here Frank O'Brien, another local man, made his first stage appearance. Later, for years, he played in the United States and Europe in many successful engagements. Willard Newell, romantic actor of former years, was a son of Judge Newell, a Bradford pioneer who was owner of the Academy of Music on lower Main street.

Bradford had some high class hotels, including the St. James, the Riddwell (now the Holley); the old Parker House; the Tuna Valley hotel, destroyed by fire many years ago; the old Bradford House, also burned; the LaPierre, likewise destroyed by flames; Dave Lauber's Arlington; Sam McBride's Option House; Tom Goodwin's famous grill; Jule Andrews', Tom Conneely's and Pat Mulqueen's places; Gallagher & Devine's and other refreshment emporiums well remembered by old-time Bradford oil men.

Since Mr. Volstead's advent in the affairs of America, Bradford is strictly dry. Times are not what they were.

Volunteer Firemen

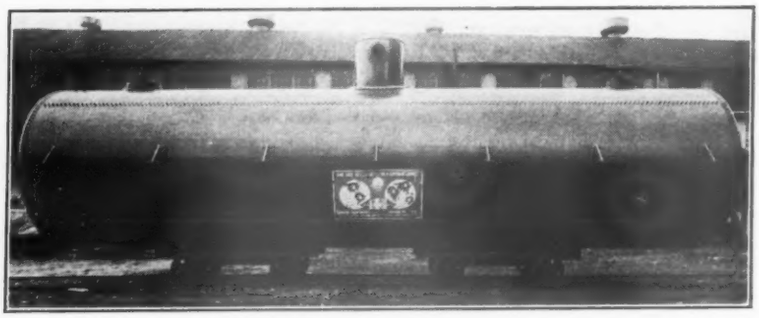
Bradford's old-time volunteer fire department included in its membership, honorary and active, many oil men, also employes of local oil field supply establishments and others and they made a good showing in protecting property. Their parade days were events of importance. It was on one of these occasions when a Main street saloon keeper displayed a sign that attracted attention. It read: "Welcome Firemen! Beer, 5 Cents a Glass!" Unlike the oil industry, demand kept pace with supply, in the beer business on gala days and at other times.

But there were celebrations here that introduced tragedy as well as comedy. At a reunion of the Bucktail Regiment the town was crowded and a great parade took place. In the evening there were illuminations, band concerts, and other things. Corporal Tanner addressed a great multitude and all was well until an effort was made by a local experimenter to burn natural gas in red fire. He had developed a gas torch provided with a magazine which contained red fire powder, the latter to be fed into the gas as it sought an outlet at the jet. The plan was to have the red flame flow from the torch and thus add to the spectacular effects. Thousands of people were in the street when the gas was lighted and then something happened. An explosion tore the apparatus to fragments, hurling metal missiles through the crowd with deadly force, killing three persons and injuring many others. I have never heard of any similar experiment to denature the color of burning natural gas.

Took Pride in Sports

Bradford always took pride in its driving park and its baseball organizations. Athletic sports were very popular here in the olden days. Boxers and wrestlers contributed to the entertainment of the oil men, and experts of

HAMMOND SPECIFICATIONS



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national reputation figured in the programs.

At Custer City, a suburban town, a bull and bear fight was actually advertised and arranged as a special attraction to provide a new thrill for sport lovers. It was, of course, a fiasco.

Owing to the extended latitude given to some of the outdoor and indoor sports here, people in other towns became critical and for a long time "Bad Bradford" was a favorite designation utilized by flippant newspaper writers. Bradford was wicked in spots, but it had so many good qualities and good people that the nickname was really slanderous. Comparatively few murders or robberies were ever perpetrated here. The "stickup" industry, now so common, was practically unknown locally during the Bradford oil boom.

One bank robbery was committed. On March 1, 1888, George Kimball, of Wyoming, entered the Bradford National Bank during business hours, shot Cashier Tomlinson, pocketed, in a linen duster, all the currency within his reach, and walked out of the building. Alarm was given, a crowd followed him and he fatally shot one of his pursuers. Overtaken by a policeman at a railroad crossing when a train was passing, he sent a bullet into his own head and so ended the incident. The cashier of the bank died of his wounds. The stolen money was recovered.

Enormous Gasser In Sante Fe Springs

By Special Correspondent

LOS ANGELES, Feb. 23.—Union Oil Co. of California added a little more excitement to the field work. Its Bell No. 2 at Santa Fe Springs blew in late last Saturday afternoon with a discharge of gas estimated at a hundred million cubic feet a day. The force of the outbreak wrecked the derrick, but did no other damage; but fire started by friction, and which flamed up at about 2 o'clock this morning and burned for ten hours destroying everything combustible. The 400-foot column of flame and dense smoke could be seen 20 miles away. Finally the well sanded up and the fire was choked off.

The well was being drilled with a rotary and was a little over 2000 feet deep. It is located 500 feet from the Bell No. 1, that is flowing 4200 barrels a day, and also 1350 feet from the Alexander No. 1, the great gasser that came in three weeks ago.

Proceed With Test At Fallon

FALLON, Nev., Feb. 24.—Following action taken by the stockholders of the Diamond Oil Co., this company has decided to proceed with its test near this city. The hole is now 1272 feet with the drilling suspended. The Lahota Nevada Oil Co. expects to cement 10-inch casing below a depth of about 2000 feet. Although there are a dozen tests under way in the Fallon district, most of them are shut down at the present time.

Devises Flow Tank Allows Gauge On Individual Well Production

Staff Special

TULSA, Feb. 24

IN THE Bureau of Mines report on "Petroleum Engineering in the Deaner Oil Field," an interesting section deals with methods used in this field to determine production of individual wells on a lease, instead of the usual practice of allowing all wells to flow into one storage tank, the oil there to be gauged in order to arrive at the production of the lease as a whole.

Of course, insofar as running the oil to the pipe line company is concerned, the total production of the tract or lease, or whatever amount is gathered in the stock tank, is all that is necessary, but in order properly to accumulate data with reference to actual performances of wells, from which to compute decline-curves, depletion and life of wells, records of individual wells are much more desirable, as well as giving more accurate results.

In the "Manual of the Oil and Gas Industry," issued for the guidance of oil operators in the computation of their taxes, in setting forth information which the Internal Revenue department requires of tax-payers seeking depletion allowances, and suggesting methods of gathering such information, this subject is mentioned as follows, pages 85 and 86:

"One of the important uses for which production records are kept is for the estimation of future production. Care should be exercised that such records provide information in a form which may be used most advantageously for the purpose.

"Records of individual wells should show the total production of the individual wells for equal consecutive periods of time. While it is true that the longer the period covered by the production records the more accurate the production-decline curves formed from them will be, nevertheless for new fields or new tracts, valuable and fairly reliable curves may be formed upon which to base estimates of future reserves if the production records are kept for short unit periods of time. The records for old fields usually show the yearly production of wells or tracts. For new fields, or new tracts, if individual well records of consecutive monthly or even weekly periods are kept, a fairly reliable production-decline curve may be constructed while the field or tract is still comparatively young. Care must be taken not to use the records of new wells which are still in the erratic period of flush production.

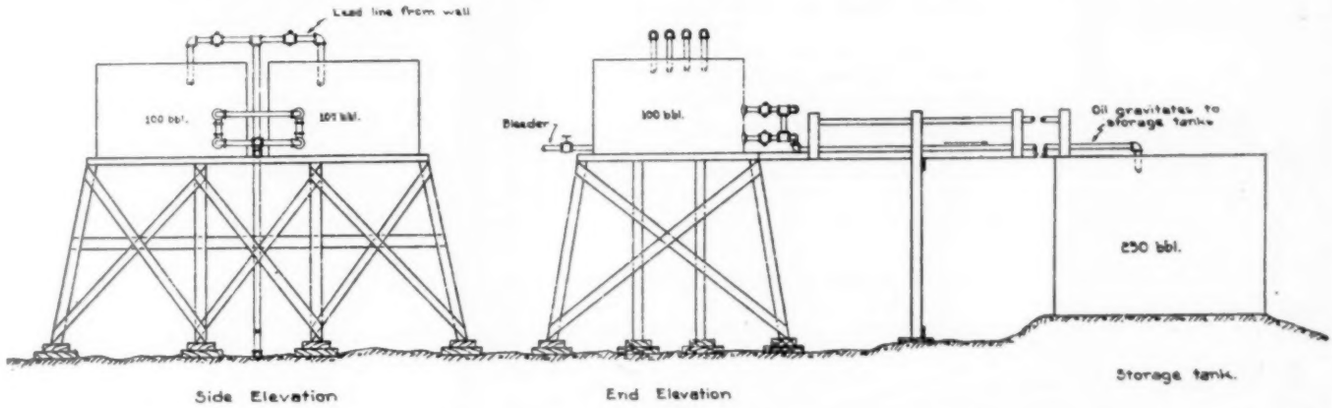
"The production-decline curve is more reliable when made from records of individual wells than from records of total tract production. Where possible, records of individual well production should be kept. Tract records often include records of wells of widely differing production for the same period. Thus, the same elements of error as are inherent in the percentage-decline curve may enter into the use of these tract records—that is, when wells of different sizes are grouped together to obtain an average decline.

"There is frequently a period during the flush production of any well where the production is erratic before the period of symmetrical decline sets in. Tract records necessarily include these irregularities. Also, the average well production of tract records usually shows either sustained production or accelerated decline due to the addition of the records of new wells whose initial production is above or below the production of the old wells at the time the new wells were brought in. Such production-decline curves when applied to the estimation of future reserves for a definite number of wells already producing are liable to introduce a considerable error.

"However, it is often impracticable to have individual tanks for each well, and in such a case, if an extra tank is provided, into which on consecutive days the runs from the different wells may be placed, tract production may be apportioned with considerable accuracy among the various wells of the tracts."

Aside from the tax-features of the case, it is often desirable to arrive at individual well productions, in order to determine as nearly as possible how each well is holding up and to ascertain the causes of unusual decline of any of them. Under the ordinary system of running all the wells into one tank, any estimate as to the performance of individual wells is a little better than a guess, and in all probability no two guesses would be alike as to any one well.

It would be a simple matter, and not unduly expensive, when the benefits to be derived from it are taken into consideration, to so install flow tanks that records of individual well production could be quite accurately kept, and there are a few companies which have already commenced to do this, realizing the value to them of accurate knowledge of the performance of their wells.



Among the companies operating in the Deaner pool who have made installations for the purpose of measuring individual well-production, according to the Bureau of Mines report, is the Kingwood Oil Co. of Okmulgee, which is gauging individually the production of a number of its wells. In the arrangement used by this company, two 100-barrel tanks are set up on a wooden structure about 12 feet high, or of such a height that the bottoms of the 100-barrel tanks are approximately level with, or slightly higher than, the top of a 250-barrel stock tank. Lead lines from the various wells rise between the two 100-barrel tanks, with necessary pipe and fittings for each riser so that the oil may be allowed to run into either of the tanks, one tank receiving oil from all the wells, while the other is used for gauging the production from any one well which may be turned into it simply by closing one stopcock and opening another.

Flow lines from these tanks conduct the oil by gravity to the stock tank. Each of the smaller tanks is equipped with a bleeder with which to draw off accumulated water in the bottom. This arrangement necessitates only one additional wood tank to the usual flow-tank installation, which together with the wood structure and necessary fittings cost approximately $250.

By thus gauging individual wells, and keeping accurate records of these gauges, a complete history of the well's performance may be arrived at, and any unusual falling off in its pro-

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duction may quickly be noted and, if possible, remedied. This method also gives the opportunity of noting the date and order in which water begins to appear in various wells, and allows them to be closely watched thereafter, while the effect the water is having on the production of any of the wells may be determined readily. By knowing what each well is doing, it is possible to determine more closely than is the case under prevailing methods the number of hours a well should be pumped to get the best and most economical results, depth at which the pump should properly be set, length and number of strokes in pumping, when it becomes necessary to clean out, and other information, all being of practical benefit in the operation of the lease, while the "economic limit," beyond which operation of a well ceases to be profitable, may readily be determined, and the well abandoned before its further operation results in loss.

1921 Production Sets High Mark For Mexico

By Special Correspondent

NEW YORK, Feb. 24.—Mexico during 1921 produced 195,064,089 barrels of petroleum and exported 172,273,179 barrels of crude and refined oils, according to the preliminary figures of the Mexican Treasury Department announced here by the American Petroleum Institute. The production was 31,524,089 barrels more than in 1920 when it was 163,540,000 and more than double the 1919 total. A summary of 1921 production and exports by months and the totals of the preceding four years follows:

Months		Production	Exports
Jan.		16,240,038	17,573,593
Feb.		15,548,232	15,278,102
March		17,841,887	15,087,949
April		18,580,170	14,943,889
May		16,726,185	13,638,009
June		16,972,917	16,819,278
July		11,397,260	5,816,483
Aug.		8,987,070	5,421,255
Sept.		12,740,835	16,544,694
Oct.		14,984,308	15,782,704
Nov.		21,113,448	16,606,858
Dec.		23,931,739	18,760,365
Totals	**1921**	**195,064,089**	**172,273,179**
	1920	**163,540,000**	**151,314,063**
	1919	**87,072,954**	**77,703,289**
	1918	**63,828,326**	**51,768,010**
	1917	**55,292,770**	**42,545,843**

May Build More Gas Lines

BILLINGS, MONT., Feb. 23.—There are several Montana communities within striking distance of the line of the Gallatin Gas Co.'s natural gas line from this city to Elk Basin field, now urging that they be supplied with gas for fuel. Laurel already has gas. Preliminary work has been completed for a line to Joliet, while there is now a movement in progress to construct a line to take gas to Red Lodge by the way of Bearcreek and Washoe. It would be about 13 miles long and would cost about $250,000.

In And Out Of Tampico

Staff Special
TAMPICO, Feb. 23

MEXICAN Gulf Oil Co., Mellon interest of Pittsburgh, is carrying on its field scouting operations in Mexico through men of geological training. This permits of closer checking on drill cuttings in the wells, whether in "wildcat" or semi-proven territory. B. W. Allen, who did geological work in the central north Texas fields at the time Ranger was at its height, is scouting the Southern district for the Mexican Gulf and Parker A. Robertson is in the Panuco territory. Robertson, who hails from Tulsa and who got his geological training at the University of Oklahoma, is a son of the late A. F. (Tony) Robertson, widely known as an oil country writer.

* * *

A. H. Gilliam, formerly in charge of field work at Panuco for the Mexican Gulf Oil Co., but who more recently is doing contract work with his brother, Luke Gilliam, in the fields of Mexico, is spending a few weeks in The States. He left Tampico last week for San Antonio and will visit Mexia and Houston before his return south. His brother, Luke Gilliam, also was a Gulf man for years prior to taking up business for himself.

* * *

Ernest Nicklos, drilling contractor at Tampico and owner of one or two of the Zacamixtle wells completed in recent months, is spending some time in The States but is expected to return to Mexico shortly. His family stays in Iowa when not with Mr. Nicklos at Tampico and he makes periodical trips to The States to visit them.

* * *

President E. J. Sadler of the Compania de Petroleo de Transcontinental, S. A. (Standard Oil Co. of New Jersey) and Vice President A. F. Corwin, who is also president of the Carter Oil Co., which latter operates in the Mid-Continent domestic fields, are due in Tampico from New York to confer with J. A. Brown, vice president in charge of the Transcontinental's operations on the ground in Mexico.

* * *

President W. L. Connelly of the Mexican Sinclair Oil Corp., and in general charge of all the Sinclair foreign interests, is on his way to New York headquarters. Mr. Connelly stopped off in Houston to visit his family, and made his way to New York City by way of Tulsa. W. H. Sharp is vice president in charge of Tampico district operations and Walter Tschudin is treasurer.

* * *

Earl Oliver, vice president and general manager of the Marland Oil Co. of Mexico, S. A., who has spent the last six weeks in the Panuco territory, southwest of Tampico, left Tampico early in February for headquarters at Ponca City, Okla. He came to the Tampico region about the first of the year from La Paz, Guyaymas, Sonora, where he had made supervisory inspections of investigation work being carried on by a geological corps under the field direction of Carl Beal, formerly of Los Angeles. Panuco operations which include the drilling of a first well on the Limon hacienda, are under the direction of Vice President Chester Westfall, who now maintains offices at Panuco, V. C., and E. A. Trager, in charge of geological work.

* * *

Paul J. Blackmon, in charge of New England Fuel Oil Co. (Magnolia Petroleum Co.) interests in the Panuco field, is spending a few weeks in The States. Mr. Blackmon left Tampico about 10 days ago.

* * *

E. ("Kid") Moore, widely known in Gulf Coastal Texas territory and more recently making his headquarters in Tampico, is drill contracting in the fields of Mexico. He makes his headquarters at the old Southern hotel.

* * *

R. A. Sperry, formerly identified with Mid-Continent operations of the Gypsy Oil Co. (Gulf Oil Corp.) and later in charge of Ranger production for the Texas Pacific Coal & Oil Co., is now jefe (boss) of the Continental-Mexican Oil Co. operations out of Tampico. The Continental-Mexican is a subsidiary of the General Petroleum Co. of San Francisco.

* * *

Douglas R. Semmes, formerly of the University of Alabama and a geologist of note is now in charge of the field research work in Mexico of the Compania Mexicana de Petroleo "El Aguila," S. A., (Mexican Eagle Oil Co., Ltd.) stock controlled by the Royal Dutch-Shell group. Mr. Semmes has been with the Aguila about 18 months.

* * *

P. J. Moran, in charge of operations of The Texas Co. of Mexico, S. A. in the Tampico territory, is a son of Mart Moran, vice president of The Texas Pipeline Co., at Tulsa. The younger Moran has been in Mexico for a number of years and is also familiar with conditions in South America, where he has been over some of the ground. In addition to its field operations around Tampico, The Texas Co., of Mexico, S. A., operates a topping plant at Agua Dulce.

* * *

Frank A. Herold, now with the Cias. del Agwi, S. A., at Tampico, was formerly identified with federal oil valuation work under the treasury department at Washington. His work is under T. R. Batte, Jr., now resident general manager at Tampico of the Atlantic, Gulf & West Indies Steamship Co.'s subsidiary and formerly in charge of East Coast Oil Co., of Mexico, S. A., (Southern Pacific) operations.

* * *

Paul Adams, connected with the sales department of the Continental-Mexican Oil Co., which operates a refinery on the Panuco river, below Tampico, is an old newspaper man. Adams formerly was

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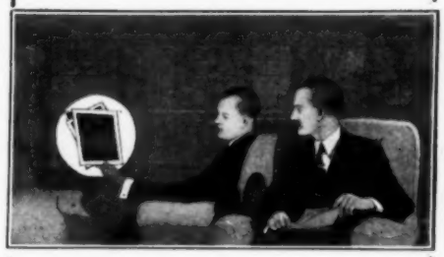

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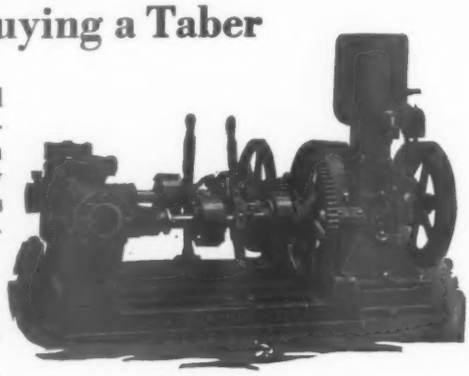

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a reporter on the now defunct Mexican Herald, the English newspaper at Mexico City that flourished under the management of Paul Hudson in the regime of Porfirio Diaz. Ten years or more ago Adams was a newspaperman in Houston, Tex., and Topeka, Kan. He married a Topeka girl about a year ago.

* * *

Fisher Durham, drilling contractor, who has spent years in the producing fields of Mexico, but who has been living in Houston for a number of months, is coming to Tampico. After attending to personal affairs in the oil metropolis of Mexico he will go over the situation with the possibility of again taking up contracting work out of Tampico.

* * *

C. C. McDermond, formerly connected with the sales department of The Texas Co. at Tulsa, and more recently scouting the Southern district producing fields for The Texas Co. of Mexico, S. A., sailed early in the month from Agua Dulce for Italy. He will familiarize himself with export conditions affecting the company's distribution of petroleum products.

* * *

Charles W. Hamilton, general agent at Tampico of the Mexican Gulf Oil Co., is a University of Oklahoma man. While in school at Norman he conducted a "press agent" bureau for the geological department, which Oklahoma editors are credited with saying was on a very high plane. After leaving school, Mr. Hamilton went to Mexico and for a time was with "El Aguila," prior to forming his present connection with the Gulf Oil Corp. subsidiary.

Peters Is Working For Co-operation

Staff Special

TULSA, Feb. 23.—Co-operation between the Mid-Continent Oil & Gas Association and the Tulsa Chamber of Commerce in enterprises interesting both bodies will be one of the chief aims of Charles B. Peters, recently elected president of the commercial body, during his term of office.

First steps in tying the two organizations together will be taken at a meeting of the general membership to be held Feb. 24. Mr. Peters feels that the Chamber of Commerce has interested itself in the past too exclusively in the general business interests of the city without giving sufficient attention to the petroleum industry.

SALT LAKE CITY, UTAH, Feb. 23.—Drilling probably will be resumed on the Ohio Oil Co.'s test at Caineville, in Wayne county, by the first of March, after standing cemented at 2700 feet for several weeks. Cavy formations have caused slow work in this test.

There has been no announcement of plans by the Carter Oil Co., following its abandonment of the test on top of the San Rafael swell in Emery county.

The Ohio Oil Co. recently acquired 1600 acres adjoining the permit on which the Ute Petroleum Co. and the Utah Southern Co. had several showings of oil. This test is in 13-4-6, about six miles southwest of Duchesne.

Speaking Plans Set For Oil Engineers

KANSAS CITY, Feb. 24.—Arrangements for the engineering congress on the petroleum industry to be held here March 6 and 7, have been completed by the Engineers Club of Kansas City and the Kansas City section of the American Society of Mechanical Engineers. The program of speakers and discussers follows:

Geology

Speaker—M. M. Valerius, consulting petroleum geologist, Tulsa.

Discusser—Dr. Erasmus Haworth, University of Kansas, Lawrence, Kans.

Drilling

Drop Bit and Rotary Methods

Speaker—R. M. Stuntz, Superintendent oil production the Empire Co., Bartlesville.

Discusser—William H. Shackelford, Kansas City, and H. P. Porter, Gypsy Oil Co., Tulsa.

Transportation

Pump and Pipe Lines

Speaker—Charles A. Mason, assistant superintendent, Empire Pipe Line Co.

Discusser—S. B. Hadley, McIntosh & Seymour.

Refining

Mechanical Methods

Speaker—Dale S. Miles, refinery engineer, the Empire Co., Bartlesville.

Discusser—LeRoy Arnold, Sinclair Refining Co.

Chemical Processes

Speaker—Dr. Roy Cross, Kansas City Testing Laboratories.

Electricity in Oil Fields

Speaker—W. F. Barnes, Westinghouse Elec. & Mfg. Co., Kansas City.

Products of Oil and Uses

Speaker—J. F. Cook, lubricating engineer, Standard Oil Co., Kansas City.

Discusser—Walter C. West, Galena-Signal Oil Co., Kansas City.

Engineer as a National Asset

Speaker—Dexter S. Kimball, president, the American Society of Mechanical Engineers.

Oil Supply of World

Speakers—David White, chief geologist, United States Geological Survey, Washington, and Mowry Bates, consulting geologist, Tulsa.

Financial State of Industry

Speaker—R. P. Brewer, chairman, Exchange National Bank, Tulsa.

Gasoline from Casinghead

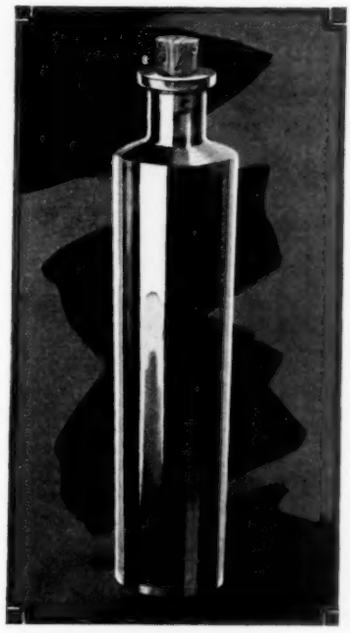
Speaker—H. B. Bernard, the Sinclair Co., Tulsa.

Discussers—Louis Bendit, petroleum engineer, Kansas City, and Robert W. Scoog, Gasoline Recovery Corp., New York.

Accounting

Speaker—H. M. Rush, Abercrombie & Rush, public accountants.

An invitation to attend has been extended to all chemists, geologists, engineers, members of engineering and allied organizations and of the various engineering college alumni associations in the United States who are residents of territory contiguous to Kansas City.



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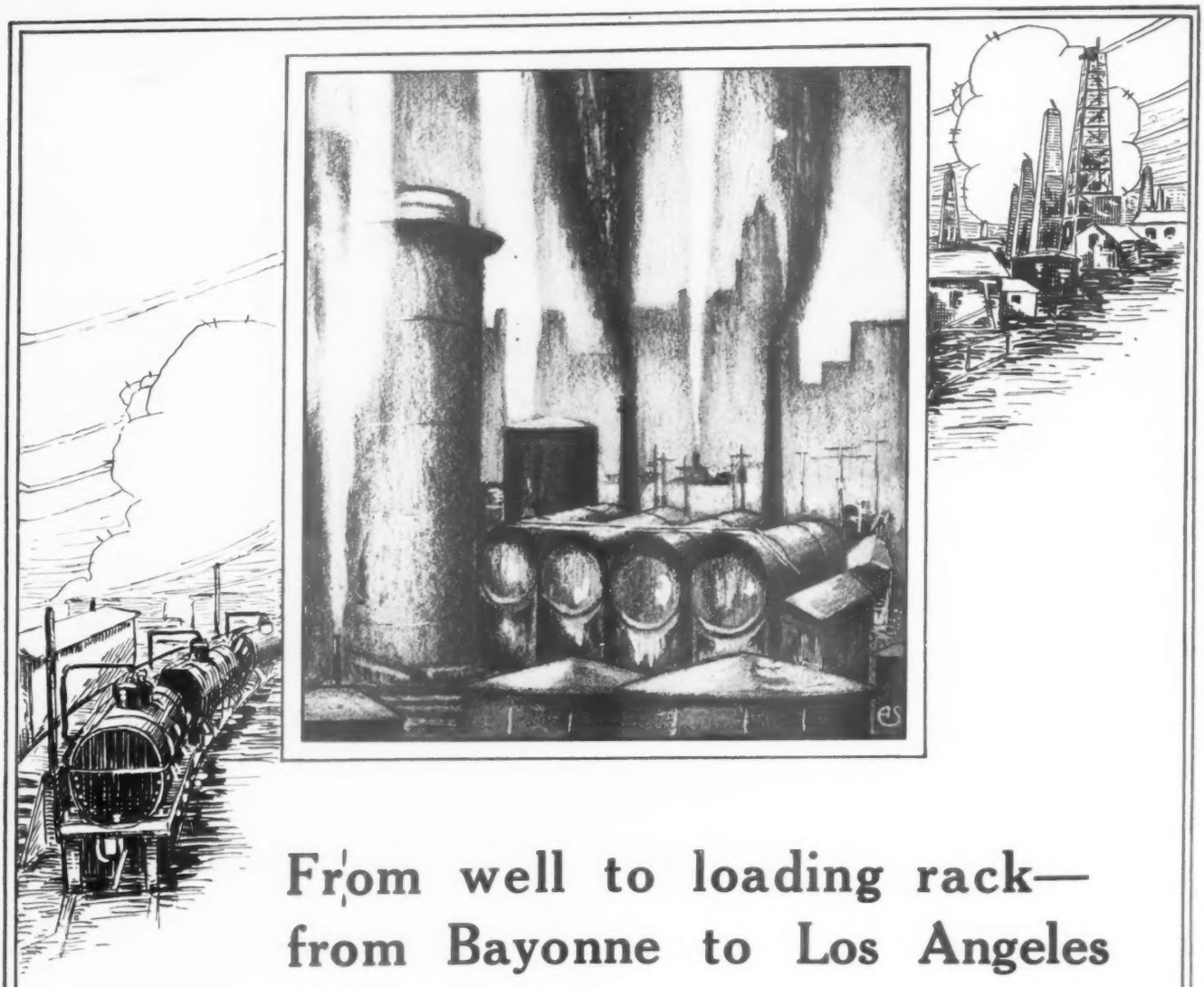

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Chart No. 2—The Wax Plant
Others to appear from time to time.

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California First In 1921 Production; Oklahoma Ranks Second

By Special Correspondent
WASHINGTON, Feb. 23

CALIFORNIA led the states last year in the production of petroleum, according to the preliminary statistics of the United States Geological Survey which have recently been compiled. This state, whose production was cut down during September, October and November because of the strike of oil field workers, had a total recovery for the year of 114,709,000 barrels, surpassing Oklahoma, the second state, by 73,000 barrels.

The gain of California over the 1920 production in this state was 9,041,000 barrels or more than one third of the gain of the whole counrty in 1921 over 1920 figures.

Oklahoma produced 113,978,000 barrels in 1921, of which 21,592,000 barrels came from Osage county and 92,386,000 barrels from the remainder of the state. This state's total produuction in 1920 was 105,725,000 barrels of which Osage county produced 20,007,000 barrels and the remainder of the state 85,718,000. The gain over the previous year was 8,253,000 barrels.

Texas Ranks Third

Texas ranked third in production. The total for the state was 103,322,000 barrels as against 96,000,000 in 1920, a gain of 7,322,000 barrels. The central and northern fields of the state produced 70,892,000 barrels and the coastal fields 32,430,000. The central and north Texas fields declined 60,000 barrels from the 1920 production but the coastal field gained 7,382,000 barrels.

The increase in these three states in 1921 over 1920 totaled 24,616,000 barrels almost offsetting some of the declines in the older fields as the year's increase for the whole country was but 26,237,000 barrels. The grand total advance for the year was from 443,402,000 to 469,639,000 barrels.

The El Dorado field in Arkansas was brought in with a production of approximately 10,190,000 barrels in the last 10 months of the year. This field started out in March with 10,000 barrels, and gradually subsided to 1,200,000 barrels production for December. Montana production moved from 336,000 in 1920 to 1,435,000 in 1921.

Wyoming in 1921 produced over 2,000,000 barrels more than in 1920 and Kentucky gained 270,700 barrels. Production picked up 242,000 barrels in southwestern Indiana and slight gains were made in New York, and northwestern Ohio.

Many Fields Decline

Production decreased in all of the other fields, being greatest in northern Louisiana where it receded from 33,896,000 in 1920 to 24,793,000 in 1921. The coastal territory declined from 1,753,000 to 1,730,000.

Stocks of crude petroleum on hand at the end of each month of 1921 graduall increased from January to December and at the end of the year were the greatest in the history of the industry in this country. Starting with 124,256,000 on Jan. 31 the accumulations increased by six to eight million barrels a month until the end of August during which month consumption more nearly reached the rate of domestic pro-

(Continued on page 83)

Production Of Petroleum By States

(Thousands of Barrels)

State	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1921	1920
California (a)	10,177	9,184	10,482	10,170	10,448	10,120	10,247	10,026	7,894	7,065	8,804	10,092	114,709	105,668
Okla. Osage County	1,383	1,452	1,782	1,677	1,764	1,723	1,746	1,914	1,901	1,976	2,122	2,152	21,592	20,007
Remainder	7,106	6,485	7,837	7,855	8,218	7,970	8,380	8,253	7,814	7,653	7,252	7,563	92,386	85,718
Texas Cent. & North	6,419	5,774	6,721	6,178	6,228	5,842	5,523	5,265	4,710	4,846	5,908	7,478	70,892	70,942
Coastal	2,610	2,566	2,976	2,757	2,669	2,448	2,557	2,873	2,796	2,730	2,813	2,635	32,430	25,048
Kansas	2,368	2,478	3,086	3,300	3,505	3,472	3,418	3,332	3,005	2,825	2,726	2,717	36,222	38,501
La. Northern	2,531	2,172	2,105	1,959	2,391	2,130	1,998	1,789	1,825	1,820	1,757	2,316	24,793	33,896
Coastal	156	156	168	156	160	150	155	138	130	126	115	120	1,730	1,715
Wyo. Salt Creek	804	868	915	1,174	1,185	1,180	669	1,001	826	959	1,049	1,503	12,133	10,051
Other districts	638	629	699	739	791	678	474.6	471	538	522.8	455.4	433	7,088.8	7,020
Arkansas (b)	.....	.....	10	300	550	880	1,400	1,900	1,400	1,300	1,250	1,200	10,190	.....
Illinois	852	785	963	765	863	823	805	846	806	890	837	809 4	10,044	10,772
Kentucky	743.8	695	768.7	767.7	826.3	730	706.6	786	729.9	716.4	717.8	762.	8,950.6	8,679.9
West Virginia	645	634	760	691	712	631	727	681	613	628	607	674	8,003	8,173
Pennsylvania	620	603	675	636	678	615	566	675	602	580	594	590	7,434	7,454.4
Ohio Cent. & Eastern	433	427	469	443	466	464	403	444	417	405	409	414	5,194	5,285
Northwestern	186	175	193	179	191	191	173	183	172	166	157	173	2,139	2,127
Montana	78	115	97	96	118	114	116	119	137	153	143	149	1,435	336
Ind. Southwestern	71	70	77	76	81	80	77	78	73	70	70	68	891	649
Northeastern	24	22	24	26	26	25	22	24	21	22	16	20	272	283
New York	84	66	86	84	104	78	79	86	88	77	68	80	980	906
Colorado	9	9	10	10	10	9	8.4	9	9	8.2	8.6	8	108.2	110
Tennessee	1.2	1	1.3	1.3	.7	1	1.4	1	1.1	.6	1.2	.6	12.7	12.7
Total	37,959	36,366	40,905	40,040	41,985	40,354	40,252	40,894	36,508	35,539	37,880	41,957	469,639	443,402

(a) Average of figures reported by Standard Oil Co. and Independent Oil Producers' Agency. (b) Preliminary, estimated in part.

Stocks of Petroleum On Last Day Of Each Month In 1921

(Thousands of Barrels)

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
Appalachian (N. Y. Pa. W. Va. Eastern & Central Ohio)	2,486	2,772	3,307	3,484	3,888	4,061	4,150	4,138	4,229	4,339	4,336	4,670
Kentucky	962	1,326	1,424	1,385	1,614	1,807	1,804	2,044	2,053	1,881	1,971	2,168
Lima—Indiana	1,040	1,010	1,121	1,156	1,121	1,156	1,201	1,264	1,110	1,158	1,136	1,014
Illinois—S. W. Indiana	3,189	3,710	4,332	4,490	5,030	5,526	6,075	6,396	6,473	6,733	7,122	7,567
Mid-Continent (Okla. Kans Central & North Texas)	68,651	70,153	73,910	77,369	81,086	84,319	88,427	89,591	90,140	90,194	89,317	91,983
North Louisiana and Arkansas	7,535	7,686	7,652	7,606	8,090	8,902	9,485	9,765	9,650	9,199	9,493	10,418
Gulf Coast	11,248	12,730	13,386	14,413	15,295	16,340	16,476	16,360	17,150	17,159	17,422	17,606
Rocky Mountain	727	760	726	842	888	874	1,247	1,007	1,113	1,098	1,360	1,635
Stocks east of California .....Net	95,838	100,147	105,858	110,745	117,012	122,985	128,865	130,565	131,918	131,761	132,357	137,061
California (a)	21,261	21,566	22,896	23,974	26,602	28,354	30,165	32,338	32,158	31,574	31,716	33,289
Mexican petroleum												
Atlantic Coast.....Crude	3,501	4,245	3,957	3,671	3,363	2,694	2,426	1,654	2,914	4,186	5,361	5,712
Atlantic Coast.....Topped	775	905	1,155	1,420	1,564	1,131	1,055	583	914	1,182	1,896	1,599
Gulf Coast.....Crude	2,348	3,162	3,637	4,458	4,241	4,496	3,573	2,455	2,598	2,564	3,523	5,413
Gulf Coast.....Topped	533	859	678	748	882	1,243	1,123	581	859	1,340	1,437	816
Pacific Coast .....Crude	.....	.....	.....	.....	150	145	145	14	.....	.....	.....	.....
Total Mexican	7,157	9,171	9,427	10,297	10,200	9,709	8,322	5,287	7,285	9,272	12,417	13,540
Grand Total	124,256	130,884	138,181	145,016	153,814	161,048	167,352	168,190	171,361	172,607	176,490	183,890

(a) Average of figures reported by the Standard Oil Co. and the Independent Oil Producers' Agency.

BIGGS TANKS

Biggs Quality Storage & Station Tanks

are extra-heavy in construction, designed to meet the most exacting specifications and are used extensively by the class of trade which recognize and desire quality tanks.

BIGGS TANKS are made throughout of soft open hearth steel, rivets properly spaced and *driven hot* under *hydraulic pressure* of from 60 to 150 tons, which together with over thirty-three years experience, is responsible for the slogan—BIGGS TANKS ARE "MADE RIGHT—ALWAYS TIGHT."

Write for price-lists and discount sheets covering 166 standard sizes, ranging in capacity from 84 gallons to 25,000 gallons.

THE BIGGS BOILER WORKS COMPANY

Established 1887 Buchtel and Bank Streets, AKRON, OHIO

Underwriters' Label Service

Steel Plate Construction

Stills for Oil Refineries

Cold Weather Gasoline

OIL REFINING — HIGHWAY — CORPORATION

The Mark of a Good Gasoline

With the coming of cold weather the careful automobile owner (and almost any garage man will tell you that the average automobile owner takes better care of his engine nowadays than ever before) realizes that the ordinary motor fuel which served him well enough during the summer months, is far from satisfactory at lower temperatures.

For winter driving requires a snappier, more volatile gasoline—one that will vaporize sufficiently at freezing temperatures to catch the first spark from the starter—and that's where Highway gasoline proves its worth.

Straight run refinery gasoline, with just enough Highway casinghead (natural gasoline) added to give it the necessary low initial which makes easy starting certain, blended under pressure (which eliminates stratification), and every car carefully tested in our own laboratories before shipment—that's Highway gasoline, the ideal winter fuel.

62-64, 90 initial, 440 endpoint
64-66, 90 initial, 437 endpoint

If you are interested in a regular source of supply for a high grade gasoline which will bring your customers back for more, it will pay you to get in touch with us.

Highway casinghead (natural gasoline) for refiners and jobbers who prefer to do their own blending

Highway Oil Refining Corporation

Tulsa, Oklahoma

(Continued from page 81)

duction and importation of Mexican oil. This condition continued through September and October but in November production and importation again rose faster than consumption and close to 4,000,000 barrels were added to the stocks. The addition to stocks during December totaled 7,400,000 barrels, leaving on the last day of the year 183,890,000 barrels in storage tanks and pipe lines.

California drew on its stocks more heavily during September and October, due to the strike, but Mid-Continent stocks declined only during November.

Consumption Fluctuates

Consumption fluctuated greatly during the 12 months. It was greatest in January. Although usually high when jobbers are stocking up for the spring trade, last year it declined from the first month. It fell off more than 10,000,000 barrels in February (this was due in part to the shortness of the month) and rose less than 6,000,000 barrels during March. It then hovered around 412,000,000 barrels a month until October when it again rose to 45,600,000 barrels, gained another million in November and a million and a half in December.

The estimated consumption of domestic and imported crude oil in thousands of barrels by months, follows:

Jan.	49,444	July	41,457
Feb.	39,328	Aug.	42,523
Mar.	45,161	Sept.	41,595
Apr.	42,561	Oct.	45,181
May	41,161	Nov.	46,122
June	42,789	Dec.	47,785
1921 Total			**525,407**
1920 Total			**530,474**

Summary of 1921

Stocks, Jan. 1	123,291,000
Production	469,639,000
Imports	125,307,000
Total	**718,237,000**
Consumption	525,407,000
Exports	8,940,000
Stocks, Dec. 31	183,890,000
Total	**718,237,000**

ASTORIA, ORE., Feb. 18.—A deep test is being drilled by the Lower Columbia Oil & Gas Co., being put down near this city. The test is down to a depth of 3103 feet, according to last reports. Standard tools are being used, and an 8¼-inch hole is being sunk. Dark brown shale with some streaks of lime and sandstone has been the formation to date.

Time For Overcharge Rate Claims Extended

By Special Correspondent

WASHINGTON, Feb. 25.—Congress has passed a bill extending the time in which claims for overcharges may be filed against the Railroad Administration and for filing suits on reparation awards of the Interstate Commerce Commission against the Railroad Administration. The new time limit has been moved to Sept. 1, 1922.

The bill does not extend the time for filing suits on loss and damage claims against the Administration, according to Fayette B. Dow, counsel for the National Petroleum Association and the Western Petroleum Refiners Association. The Feb. 28 limit still stands for this class of suits.

Get Jack Frost Working For You

Give him KEEN & WOOLF Cold Weather Lubricating Oils and old Jack will be the best man on your payroll.

"K-W" Specifications

100 @ 100	Vis. 2	Color	Pale
200 @ 100	" 2½	"	"
300 @ 100	" 3	"	"
500 @ 100	" 3¼	"	"
750 @ 100	" 2½	"	"
200 @ 100	" 5	"	Red
300 @ 100	" 5½	"	"
500 @ 100	" 5½	"	"

Zero Cold Test.

100 @ 212 Vis. Black Oil 0/5 C. T.

Write us for samples and prices so you can start off a prosperous New Year in high speed.

Keen & Woolf Oil Co.

Houston, Texas

KEEN & WOOLF
FOR PROFITS IN COLD WEATHER

A Valuable Book!

"Prospecting for Oil and Gas"

By L. S. Panyity

Altho written by an experienced geologist, it is not too technical, and appeals to the practical man in the field.

Cloth $3.25 Net—Check with order—Postage extra

FOR SALE BY

National Petroleum News

800 Caxton Bldg. Cleveland, Ohio

HERE is a seasonable group of Canfield products—good sellers for your early spring trade. You can "bank" on any of them or all of them; the good name and good faith of the Canfield organization backs them as they go to you, and backs you as you resell.

Motor Oils

Canfield Motor Oils are standardized in our laboratory and sold to the trade in pure Pennsylvania and Western grades to meet selling requirements. Stock up now and be ready to supply the demand for Motor Oils of "Canfield" quality.

Canfield Oil Co. — Quality & Thirty-Six Years Experience

Tractor Oils

Tractor owners, as well as motorists, like to know they're buying quality oil. It pays to be ready for them with Canfield Tractor Oils—pure Pennsylvania and Western grades for tractors of all makes and all types.

Canfield Oil Co. — Quality & Thirty-Six Years Experience

Castor Machinery Oils

We've pioneered in the manufacture of Mineral Castor Machinery Oils for over thirty years. Due to their clinging, fibrous qualities, "Canfield Castors" are in wide use as lubricants for farm machinery. Get your share of *this* trade.

Canfield Oil Co. — Quality & Thirty-Six Years Experience

On above pages are just a few "Canfield" leaders. Here are some more—

We'll gladly quote on these or your other requirements, upon receipt of your specifications:

Filtered Stocks—Steam-refined Stocks—Cylinder Oils—Engine Oils—Auto Soap, etc.

Akron Dealers Win Reprieve In Fight Against Curb Pumps

Staff Special

AKRON, O., Feb. 21

THE swing of the retail gasoline business from the curb pump to the drive in filling station, is being pushed here by fire and police, and building officials despite a stubborn fight that is being waged by some jobbers who have put out curb pumps and tanks under leases to automobile supply dealers, garages, and a few groceries. While these jobbers say they are willing to abide by any regulations that would prohibit further installation of curb equipment, they have joined with the lessees and owners of such to keep and maintain pumps and tanks that are in use at present.

The fight over curb gasoline pumps has been carried on here for almost two years and what seems to be a final decision was reached only today. The existing pumps will be allowed to stay and to be kept in repair but no more installations will be permitted.

The chief objections to the curb pumps have been that they blockade traffic in crowded streets and that the fire hazard is extended into city property, although no serious fires have resulted from their use here.

Police Arguments

Police Captain Abram A. McConnell, in charge of Akron's traffic, said that some of the pumps are situated in narrow streets which should be kept open at all times; that motorists seeking gasoline will not keep to the right of the street but often will cut ahead of oppositely bound traffic to a pump; that pumps are often situated where no parking is allowed and thus hinder passage of other automobiles; that where automobiles are allowed to park, often cars are left standing at the curb close to the pump and those which seek gasoline are forced to stop almost in the middle of a street, compelling other machines to drive around them, and that some are situated at street intersections and blockade the walks for pedestrians.

Most of these allegations are denied by the interested jobbers, pump lessees and owners. They contend that out of 37 curb pumps left in Akron out of 60 a year ago, but one is near any important street intersection and that few are on important

(Continued on page 88)

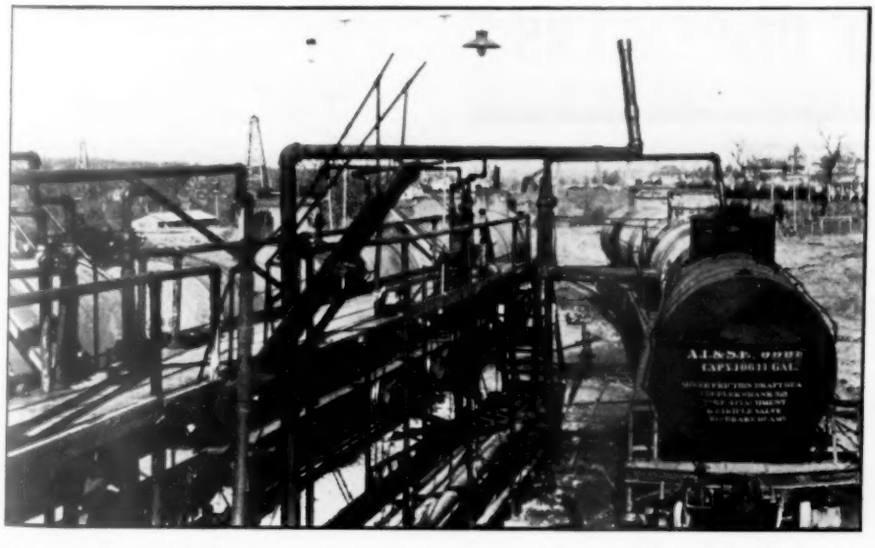
Adjustable Loading Rack Platform Reduces Danger And Conserves Time

Staff Special

TULSA, Feb. 24.—Down at the Tidal Refining Co.'s gasoline plant, near Drumright, the employes and officials together perfected a new loading rack platform that extends from the loading rack proper, over to the tank cars, thereby enabling the rack man to move from platform to car with very little trouble or danger.

The platforms, of which there are 26, are approximately 5 feet long, and almost touch the tank cars, which enables the attendant to step from platform to car with ease and safety. When the platform is pushed down an automatic safety catch holds it in position until it is released by means of kicking over an upraised pinion on the platform.

A 50-pound weight is located at the end of the platform beneath the rack, which raises platform into an upright position when pinion is released by the attendant. Safety railings are constructed of ¾" pipe reinforced with steel castings.



View of two adjustable loading rack platforms with railings extending from loading rack platform proper to tank cars. One in the foreground is raised and the one in the background is down, extending out over car.

GROETKEN

has it— What?

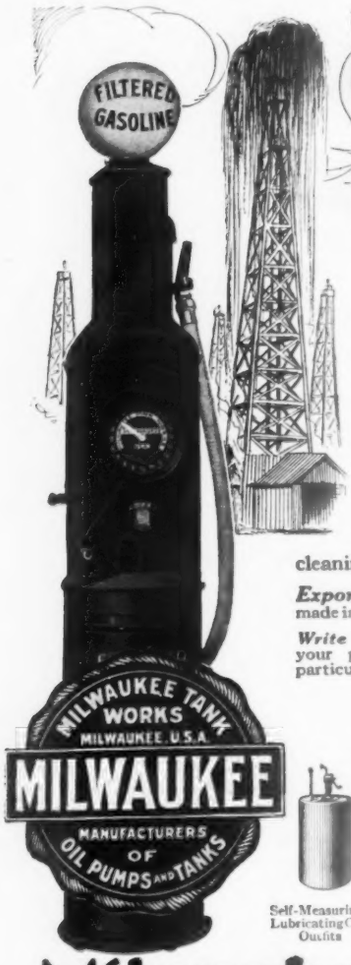
—the Pump the Oil Jobbers are talking about.

Write for literature and quotations now

The Groetken Pump Co.

Aurora, Ill.

Established in 1912



A Genuine Gusher in Rush Hours

THE acme of accuracy is the Milwaukee Rapidelivery Speed Pump for filling stations. Pumps 18 gallons per minute with ease and positive precision. Operating handle turns forward,—never backward. Illuminated dial reads front and back. Steel-cut gears; every bearing, every part built with extreme care to secure perfection, strength, durability. Subjected to rigid factory tests.

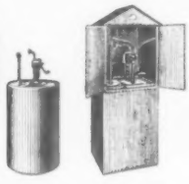
A Worthy Representative

—of the superlative Milwaukee line of gasoline and oil station equipment, underground tanks, factory and railroad oil storage equipment. Dry cleaning outfits, etc., recognized leaders for many years.

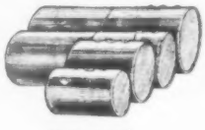
Export Department. Milwaukee Tank Outfits are also made in Imperial and Metric measurements, for all foreign countries.

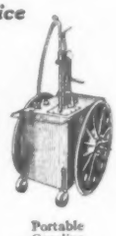
Write us. We will gladly tell you what equipment is best for your particular needs, give you estimate of cost and full particulars. Address our branch nearest you.

Country-Wide Sales and Service


Self-Measuring Lubricating Oil Outfits

Kerosene and Oil Cabinets


Underground Kant-Leek Tanks


Portable Gasoline Wheel Tanks

Milwaukee Tank Works

Milwaukee, Wis. U.S.A.

BRANCHES:

Boston, Mass. *Tremont Bldg.* | New York *Marbridge Bldg.* | Cleveland, Ohio *Plymouth Bldg.* | Chicago *Fisher Bldg.* | Minneapolis, Minn. *Plymouth Bldg.* | Kansas City, Mo. *Waldheim Bldg.* | San Francisco, Cal. *7th and Bryant Sts.*

Send for illustrated bulletins of Milwaukee Tank Works full line of

VISIBLE GASOLINE DISPENSERS

Hoyt's CRAWL-PROOF Sheet Lead

For agitator linings where high temperatures exist. Chemical sheet lead, re-inforced with hard lead bars in the body, and running full length of sheet. We furnish sheets 8 feet 6 inches wide by usual lengths. This is a wonderful invention and you will be surprised to see the good results.

Made in ST. LOUIS

Hoyt Metal Company, St. Louis, Mo.

Akron Dealers Win Reprieve

(Continued from page 87)

thoroughfares. They quote Capt. McConnell as saying only six are so situated.

Fire Chief John T. Mertz, who under Akron's new building code has the power to extend the life of curb pumps and regulate the building of filling stations, seemingly stands with the element supporting the latter. While he admits there has been no serious fires from curb pumps and tanks, he says the hazard is ever present and when gasoline is sold at filling stations, which must be at least 20 feet from any other property, this danger is removed from the city's streets. He says there is danger of leakage from the curb tanks into the sewers and the cellars of nearby buildings. On the other hand, persons interested in the pumps say that no leaks have been found in any of the tanks that have been removed and that this danger is far less than that existing where gas pipes are laid.

Code Starts Fight

The agitation against the curb pumps began with the building code. Into it was incorporated this clause: "It shall be unlawful for any person, firm or corporation to place or cause to be placed any pump or apparatus for the lifting or handling of gasoline in the public streets or alleys as established by ordinance."

And another clause says: "No tanks shall be maintained in the city of Akron after Jan. 1, 1921, without a permit or approval thereof." The fire chief under another section of the code is empowered to grant permits, approve installations and to modify any of the code's regulations if he deems fit.

Although the code provided for no more curb pumps or tanks after Jan. 1. 1921, this provision was not enforced. Chief Mertz said he desired to give "the boys" a chance to dispose of their equipment without loss which was probable at that time because of the general business conditions. On July 1, 1921, he sent letters to all owners and lessees that on or before Jan. 1, 1922, all curb pumps and tanks must be removed. Owners and lessees, and those jobbers that have put out pumps, began to look about for friends to support them and at the councilmanic election last November supported those friends for election. Some of them were successful.

When Jan. 1 came and only eight or 10 pumps had been removed since Chief Mertz had sent out his letters, the attorney of the Automobile Service Association of 125 members; the Akron Motor Vehicle Association of 30 members; the Akron Tire Dealers' Association of 17 members and 12 miscellaneous persons, called on the chief and asked him what he intended to do. When told the building code would be enforced unless good cause to the contrary was shown, an ordinance was drafted and presented to the new city council Feb. 14. This provided for the maintenance of all present pumps but prohibits further installations, a condition that seems to be getting force in this territory. This ordinance was passed today.

Did $365,000 A Year

In their arguments to the council, the persons interested in curb pumps said the combined value of their equipment was $22,111.65 and that they did a gross business of $365,000 annually. They declared passing of the curb pumps would throw about 100 men out of employment in addi-

(Continued on page 91)

(Continued from page 88)

tion to two trucks and five men comprising the truck crews. They estimated the cost of removing the tanks and pumps would be about $15,000. Reasons for keeping the pumps as stated in questionnaires sent out by the service association, was that they were business getters. However, jobbers who have few or no pumps out under lease or contract, said it made little difference to them as the filling stations would provide them with sufficient outlets. Motorists would buy gasoline, if not at a curb pump, then at a filling station, one of them said. His company also operates 10 filling stations.

One of the largest jobbing companies here which has put out perhaps a majority of the pumps, owns six filling stations and has three more under lease. Although it does a large business at these and also with the rubber tire factories here, its curb pump business is not to be ignored. It has been one of the most strenuous fighters for the curb pump.

Ten of the 37 pumps are said to be out of use; others do very little business, but several are of big proportions.

* * *

ALBANY, N. Y., Feb. 24.—A bill amending the charter of Greater New York has been introduced in the New York Assembly which provides that "no person, firm or corporation, engaged in the business of selling gasoline, benzine, oil or similar combustible liquid, shall maintain on any sidewalk in such city a pump or pumping apparatus for the purpose of supplying other persons with such gasoline, benzine, oil or other liquid unless the fire commissioner shall first have issued a permit for the maintenance thereof. Such permit shall not be issued unless the commissioner is satisfied that such pump or pumping apparatus may be so maintained without danger." The measure contains a clause making it effective immediately upon passage.

Many Exhibitors Take Space At Kansas City

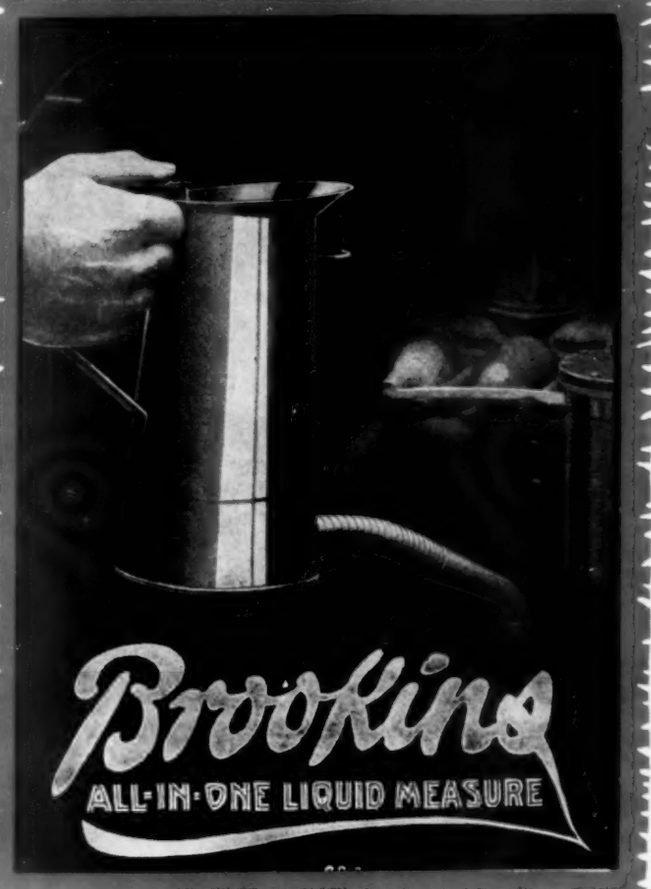
By Special Correspondent

KANSAS CITY, Feb. 25.—Fully half of the space available for exhibits at the forthcoming spring convention of the National Petroleum Marketers' Association in Kansas City has been taken. Demand for the space is surprisingly good, and the exhibits already in sight mean a very successful convention from that standpoint.

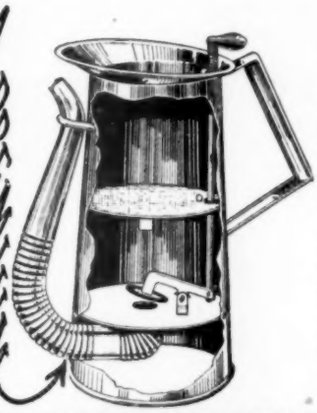
W. T. Crotzer, chairman of the committee handling hotel arrangements, reports many reservations already received. Mr. Crotzer, who is connected with the Stevens Oil & Grease Co., believes the early reservations point to a record attendance.

The agricultural districts are going to send more visitors to the convention than was expected some weeks ago. There is a decidedly better feeling in agricultural areas on account of recent rises in farm and livestock prices, so all jobbers are expected to be freer about coming to the convention to arrange for the coming season's business as well as to prepare to improve their efficiency as marketers.

JOBBERS—THIS SIGN AS A PREMIUM



WILL STIMULATE YOUR DRUM OIL SALES



Saves Time—Saves Oil

Used by filling stations, garage men, and car owners all over the United States, for putting oil into crank cases.

The flexible metal nozzle reaches the most inaccessible crank case. Oil flow is always under control. Does away with dirty dripping funnels and measures. Pleases patrons of service and filling stations.

Made in one and two quart sizes, in copper finish. Standard equipment for well managed filling stations. Jobbers and dealers in filling station equipment carry these measures in stock. Excellent premium to increase drum sales by oil jobbers.

Write for samples and prices also for leaflet PN-4 illustrating and describing measure in detail.

The Brookins Manufacturing Co.
Dayton, Ohio

Vulcan Oil Refining Company

Executive Offices—Accounting Department
Hanna Bldg., Cleveland, O.

Sales Department—Refining Works
Coraopolis, Penna.

Refiners of Pennsylvania Crude Oil

Gasolines
Napthas
Water White Oils
Absorbent Oil
Fuel Oil
Viscous and Non-Viscous Pale Neutral Oils
Filtered and Steam Refined Cylinder Stocks
Tempering and Tractor Oils
Gas Oil
White Paraffine Wax
Low and Regular Cold Test 300 Mineral Seal Oil

Tank car and barrel shipments

NOCHAR NOCHAR

Are you looking for various grades of GOOD MOTOR OILS

Then you are looking for JBN. You can readily blend this heavy Pennsylvania automobile oil with light Pennsylvania automobile oils, making various grades without the slightest possibility of the oils separating, due to our special process of manufacturing JBN.

Ask us for samples and prices

Ohio Valley Refining Co.

REFINERS OF PENNSYLVANIA PETROLEUM

St. Marys, W. Va.

Attwood Grease Cabinets

enjoy a confidence that warrants their selection.

Our No. 1 Valveless grease cabinet handles heavy fibrous greases too thick for the ordinary cabinet. There are no valves to get out of order and every down-stroke delivers exactly a quarter pound of grease. You regulate intake and delivery by a partial turn of the pump handle.

This is our No. 2 Attwood grease cabinet for medium greases and oil. Like our No. 1 cabinet, this cabinet has a patented overflow device, which catches grease or oil that passes the plunger and discharges it back into the container. It prevents waste and saves your clothes.

Manufactured by

Attwood Brass Works, Grand Rapids, Mich.

WESTERN REPRESENTATIVES

Norton Brothers Co., San Francisco and Seattle

Points Out Danger Of Tax For Soldier Bonus

CLEVELAND, Feb. 24.—Prompt action is needed if the oil industry is to be saved from a burdensome tax on gasoline in order to help pay for a soldiers' bonus, in the opinion of H. W. Burckhardt, president of the Cincinnati Oil Works Co., Cincinnati, who has written the following letter to **National Petroleum News** outlining the dangers of proposed legislation.

"We cannot view without alarm the unsound measures proposed in Congress to finance the soldiers' bonus. We are advised that it would require $5,000,000,000 to pay the bonus and if that is the present estimate, we can assume that the total would run close to $10,000,000,000 before we would be through with it. Now, such stupendous expenditure is not to be entered into lightly. If it were for the constructive development of new values that would help bear the burden of taxation it would even then be a staggering expenditure to contemplate. But the proposed soldiers' bonus is purely a gratuity with no possible constructive development in building values.

"The attempt to take this enormous sum out of business enterprises would put a blight upon Industry from which it would be unable to recover. The proposed general sales tax is objectionable. The final sales tax would not be so bad but apparently it is not favored for political reasons. If light wines and beer could be restored without the undesirable accompaniment of the saloon and with the elimination of the large expenditures for prohibition enforcement, it would tend vastly toward a sounder financial condition. Such means of taxation, however, does not seem to be favored.

"We would urge prompt action to afford adequate care and aid to all soldiers in distress or need of such aid but we feel that if the proposed soldiers' bonus is passed it would be a calamity."

Business Improving In Western States

By Special Correspondent

KANSAS CITY, Feb. 24.—Montana, Iowa, Nebraska and New Mexico are among western states that have made the most notable improvement recently as buyers of petroleum products, Kansas City distributors report. They say that Oklahoma and Texas have not the degree of improvement found in the other states. Kansas ranks close to Nebraska so far as improvement is concerned.

The explanation made here is that Texas and Oklahoma are interested to a large degree in cotton and had such poor crops last season that they are without the recuperative powers so far as agricultural purchasing power is concerned. The recent rises in corn and wheat and live stock have helped the corn and live stock states in particular.

February is usually a quiet month in trade in the West, refiners and marketers here report, but there has been an encouraging increase in inquiries and indications now augur an active market starting early in March.

Industrial Notes

The Novo Engine Co., Lansing, Mich., has put on the market a series of new gasoline motors of the four-cylinder, four-cycle vertical type. They are: Model AF with 3¼-inch bore and 5-inch stroke; Model CF with 4-inch bore and 5½-inch stroke, and Model EF with 4¾-inch bore and 6-inch stroke. The motors are heavier than the tractor or truck type of four-cylinder engines, slower in speed and have heavier crank cases and larger bearings. They are designed exclusively for use with industrial equipment. Their horsepower ranges from 10 to 40. The company recently has published Report No. 6 on the economies of Novo power equipment.

* * *

The Serv-Us Station Supply Co., Harris Trust Building, Chicago, is serving the oil trade in middle western and western states with a line of filling and tank station equipment. Its leaders are the Beacon Visible Motor Oil Dispenser and the Brookins All-In-One oil measure. The former is operated with compressed air which may be supplied from an ordinary hand pump. The latter serves as a measure, strainer and funnel. It was developed by Walter R. Brookins, a pioneer aviator with the Wright brothers.

* * *

Staples & Pfeiffer, patentees and manufacturers of S. & P. oil burners, have put out catalog No. 21, describing their burners in detail. Their burners, according to the catalog, are suited for all types of stationary, marine, B. & W., Heine, Kidwell, Erie, Wicks, Badenhaus, Parker, Sterling, pipe and donkey boilers and for brick kilns, furnaces, ovens, and retorts and for drying, tempering, annealing, baking, japanning, bending, galvanizing and smelting.

* * *

The St. Louis Pump & Equipment Co. has opened eastern offices at 223 S. Sixth street, Philadelphia. W. C. Keator has been appointed eastern manager and R. G. Wilson district manager. The company announces it plans to build up an organization to handle its eastern business in the same manner that its western business is cared for.

* * *

The Automotive Trailer Corp., Springfield, Ill., has published a catalog listing its trailer products of two and four wheel types with carrying capacities ranging from ½-ton to 20 tons. One type of "semi-trailer" is made in sizes up to 15 tons.

* * *

The Vilter Manufacturing Co., Milwaukee, are publishing a series of catalogs listing its ice making and refrigerating machinery. Equipment for wax plants is included.

* * *

The Columbian Steel Tank Co., Kansas City, has added an all-metal garage to its list of products which includes a full line of oil tanks.

* * *

The Stuber Sales Co., Little Rock, Ark., has taken over the distribution of the Fry visible pumps in Arkansas. Two men are on the road pushing these pumps.

Meters

"Niagara"

Used by refineries and oil companies for loading and unloading tank cars, loading tank wagons, etc.

Write for catalog and prices

BUFFALO METER COMPANY

2889 MAIN STREET *Established 1892* BUFFALO, N. Y.

"KEYSOL"

...

KEYSTONE

Oil & Manufacturing Co.

Petroleum Products

Aviation Gasoline	Steam Refined Cylinder Stocks
Winter Gasoline	Filtered Stocks
Summer Gasoline	Bright Stocks
High Test Gasoline	Neutrals
V. M. & P. Naptha	Paraffine Oils
Turp. Substitute	Filtered Oils
Kerosene	Motor Oils
Gas Oil	Wax
Fuel Oil	

Shipments in tank cars, barrels or cans in cases for export

Keystone Oil & Mfg. Co.

Tulsa, Okla. CHICAGO Saginaw, Mich.

FOREIGN SALES DEPT.: 82 Wall St., New York

Cable address: Brocowil, New York

SINCLAIR OILS

Petroleum Products of Quality

Gasoline Kerosene Naphtha Gas Oil

Lubricants Paraffin Wax Fuel Oil Road Oil

Shipments in Tank Cars and Barrels

SINCLAIR REFINING COMPANY

Cable Address "Sorcorp"

111 W. Washington St., Chicago Ill.

SINCLAIR OIL BUILDING 45 Nassau St., New York

REFINERY-TANK WAGON MARKETS

Try To Figure Market For March

DOUBT in the minds of both buyer and seller is the keynote of the marketing situation as March opens. Both are trying to size up the probable course of the market during the coming month and in the meantime, for the most part, neither is particularly anxious to trade. The only exceptions to this attitude during the past week were found in Kentucky and at the Independent refineries in Pennsylvania and West Virginia, where the trade was brisker than for weeks past.

Both Sides Feeling Out Market

In the Mid-Continent, some refiners refused 14¼ cents for New Navy gasoline during the week and are holding their output, current output being all they have to sell because their storage tanks are cleaned out. Jobbers, on their part, are putting out more inquiries than for some time back, trying to get a line on the refiner's position. The jobbers would like to make contracts, many of them, for gasoline over a long period while the refiners prefer to hold themselves free to market their motor fuel at spot prices.

While they put out their inquiries, many of the jobbers have not yet convinced themselves that cuts in the posted price of crude are not to be expected before the height of the spring business begins and the refiners, for that matter, are not entirely convinced either. The jobbers do not want to buy heavily when a cut in the crude market may be announced in the near future and the refiners do not want to sell their gasoline now at the market if by holding it they could get a better price for it within the next 30 days.

March Not Good Gasoline Month

The chances are that the gasoline business during March will not be very lively. While psychology often seems to cut a considerable figure in the market and a few warm bright days in March will send the jobbers into the market, the fact remains that over the greater part of the country March is one of the worst months of the year from the point of view of the automobile driver and he runs his car just as little as he possibly can.

The slowness of the demand for fuel oil in the face of the threatened coal strike seems to mean that the users have filled their storage during the lowest priced period of the last few months and are in a position not to worry if their coal supply is cut off. If the coal strike comes, however, it is almost certain to make a flurry in the fuel oil market, and if it is long continued will put fuel oil well above present prices.

Western refiners are watching with much interest negotiations that are being carried on by a large refining company for the export plant at New Orleans of the Petroleuum Import & Export Co. If the refining company gets the plant it is felt that they may make another active factor in purchasing for export from the western refiners where the Union Petroleum Co. is now the only interest active.

Prices Weakening At North Texas Refineries

Staff Special

FORT WORTH, Feb. 27.—The tone of the north Texas refinery market is weaker than last week, although prices have not fallen off much. A few plants have increased their daily crude runs but not enough to show much change in the general situation in the territory. The sluggish market is attributed generally to recent crude cuts.

Gasoline of superior quality is still moving to export from this section but 58-60 is not so much in demand as a week ago. A little gasoline of navy grade is being allowed to accumulate and a weaker price is expected during the first few days in March if the demand fails to strengthen.

Kerosene is showing practically no change even in the face of recent movements to export. Exporters are thought to be paying as much as can reasonably be expected in view of seaboard competition. Domestic demand is light and shows no indication of improvement for the present. Naptha for blending purposes is accumulating. Gas oil is weak in both price and demand and only a few refiners are making the cut at all. Fuel oil is still burdensome. Buyers are keeping pretty well out of the market and refiners holding the price up in the neighborhood of cost in the face of light demand.

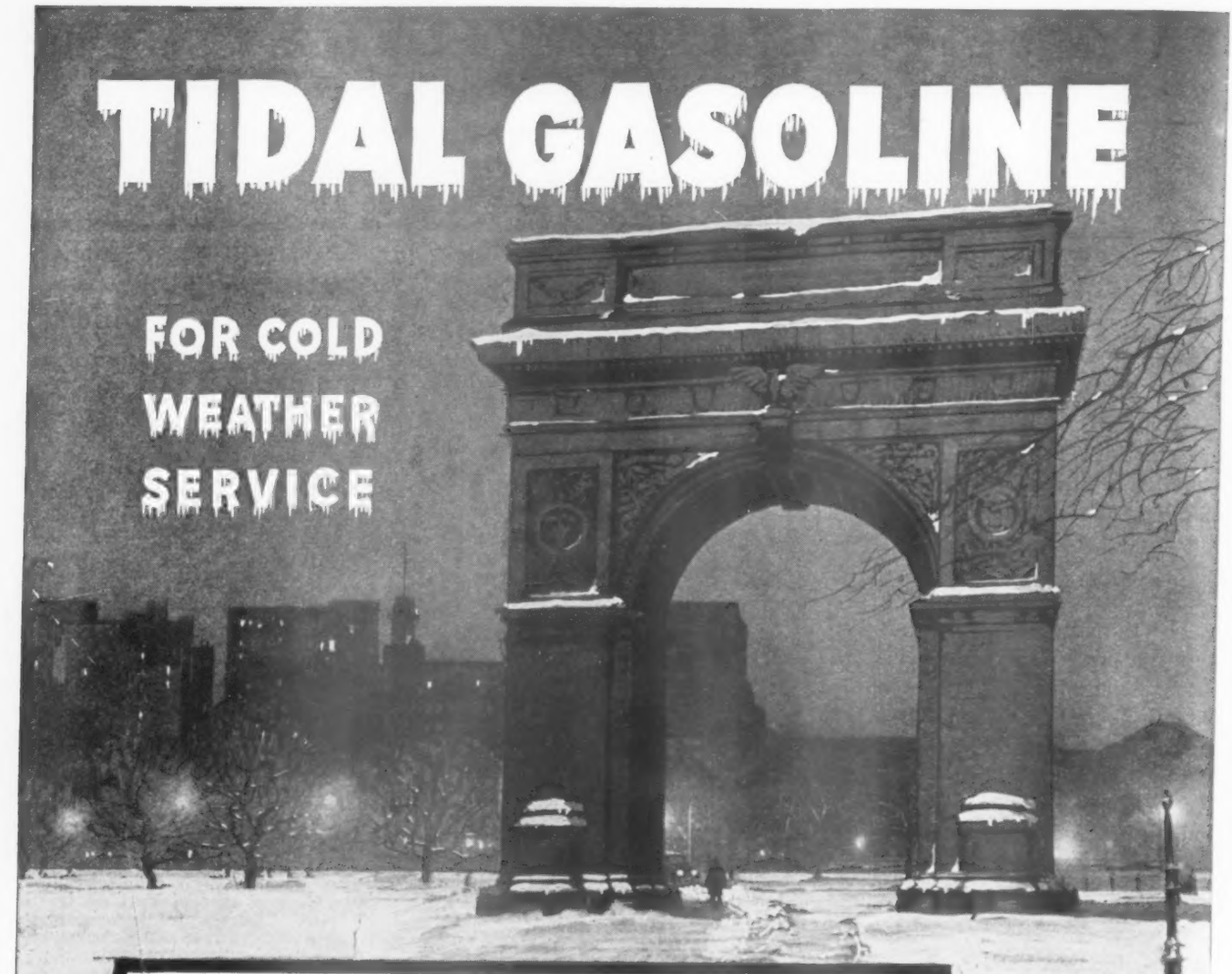
Export Outlet Seen For Gulf Coast Lubs

Staff Special

HOUSTON, Feb. 25.—Firm inquiry for 15 cars of red oils currently made by an Oklahoma marketing company in the Gulf coastal lubricant district is believed to presage possible export movement in case sales are consummated. The price offered is said to be lower than the prevailing low range on these grades but might be considered attractive in quantity sales where the manufacturer happened to be long on these oils. Lubricant manufacturers whose stocks are fairly low are not interested in the inquiry.

Some increased inquiry is reported for other south Texas grades, although not in any considerable quantity. Similarly, there is a slight increase in single car spot demand from jobbers. Generally, however, the situation is quiet.

PITTSBURGH, Feb. 25.—Stockholders of the Arkansas Natural Gas Co. have approved acquisition of the Freehold Oil & Gas Co., Plymouth Oil & Gas Co., Little Paris Oil & Gas Co., Regal Oil Co., and Benedum-Trees Oil Co. The terms were given in the **National Petroleum News** of Feb. 15.



Bulletin No. 71

That the wholesale price of gasoline, compared with the price of crude oil, has been too low is strongly indicated by the fact that about 166 refineries in the Mid-Continent field are shut down and that about 130 refineries in operation are running around 55% of capacity. Many of those still active are losing money in buying crude and selling gasoline at the present prices.

This situation in connection with the fact that stocks are very low and that all signs point to a greater consumption of gasoline in the Spring and Summer of 1922 than ever before, is excellent ground for believing that a steady rise in gasoline prices will begin with spring and that at the peak of the season the demand for motor fuel will out-strip the supply.

Under such conditions we do our best to take care of our friends, but naturally furnish Tidal Gasoline first to those who have come to us before the rush. Now is a good time to establish a connection.

M. O. Wilbur, M. E.

Wire or Write

TIDAL REFINING COMPANY

Tidal Building—Tulsa, Oklahoma

Subsidiary of The Tidewater Oil Company, New York, Makers of Veedol Quality Lubricants and Tydol Economy Gasoline

64-66 Straight-run;
68-70 Straight-run;
Natural Gasoline, Grade A, B, C, D and E;
40-43 Kerosene;
34-38 Gas Oil;
24-26 Fuel Oil.

Refinery Markets On All Products

Pennsylvania, Oklahoma, North and South Texas

FOLLOWING are the average market prices on the more important petroleum products in cents per gallon f. o. b. in Oklahoma, Texas refinery and Pennsylvania. These are actual prices at which the bulk of each product is moving from the refineries at the present time. Anyone having knowledge of different prices which have obtained on any considerable quanity of any of the products mentioned will greatly favor us by advising us at once.

GASOLINE AND NAPTHA

PENNSYLVANIA	Prices Feb. 27	Prices Feb. 20	Prices Jan. 30
54 Naptha	15 -15¼	14 -14½	13½-14
56 Naptha	15¼-15¾	14½-14¾	14½-15
58 Naptha	16½-16¾	16 -16½	15½-16
60 Straight-run gasoline	17¼-17¾	17 -17½	16½-16¾
62 Straight-run gasoline	18½-19	18	17
64 Straight-run gasoline	20	19 -20	19 -19½
68 Straight-run gasoline	23½-24	23½-24	22½-23
68-70 Blend, 450 end point	15	14 -14¼	14¼-15
60-62 Blend, 450 end point	15	14 -14¼	14¾-15
62-64 Blend, 450 end point	15	14 -14¾	15¾-
66-68 Blend, 440 end point	15½	14¾-15	-15¼
68-70 Blend, 440 end point	15½	14¾-15	-15¾
68-70 Blend, 420 end point	16 -16½	15½-16	15¾-16
OKLAHOMA			
50-52 450 end point	12¾-13	12¾-12¾	12¼-12½
56-58 450 end point	13¼-13½	13 -13¼	12¾-13
56-58 (New Navy), 437 end point 140 i. b. p.	13½-13¾	13¼-13¾	13 -13¼
58-60 New Navy, 437 end point 140 i. b. p.	13¾-14¼	13¾-14¼	13¼-13½
60-62 400 end point	15¾-16¾	15½-15¾	15 -15¼
64- 66 375 end point	17¼-17¾	17¼-17½	17 -17¼
NORTH TEXAS			
48-50 460 end point naptha	10½-11	10½-11	9¾-10¼
50-52 450 end point naptha	11 -11½	11 -11½	9½-10½
56-58 450 end point gasoline	12½-13	12½-13	12 -12½
58-60 440 end point gasoline	12¾-13¼	12¾-13¼	12¼-12¾
60-62 400 end point gasoline	15 -15½	15 -15½	13¾-14¼
64-66 370 end point gasoline	17 -17½	17 -17½	16¾-17
New Navy Specification gasoline	13 -13½	13 -13½	12½-13

NATURAL GASOLINE

OKLAHOMA			
Grade A, 72-76 under 375 end point recovery 90 per cent	14 -14½	14¼-14¾	13¼-13½
Grade B, 76-80 375 end point, recovery 88 per cent	14 -14¼	14 -14½	13 -13¾
Grade C, 80-84 375 end point recovery 85 per cent	13¼-13½	13½-13¾	
Grade D 80-84, 330 end point, recovery 80 per cent	13 -13¼	13 -13½	12 -12½
Grade E 84-87, 330 end point i. b. p.	12¾-13	12½-13	11¾-12
Grade F, 87-90 330 end point i. b. p. not below 60	12½-12¾	12½-13	11 -11½
(Motor Natural Gasoline—Blends)			
Grade 1, 60-62 450 end point i. b. p not less than 87	13 -13¼	12¾-13¼	12½-12¾
Grade 2, 62-66, 450 end point i. b. p not less than 80	12¾-13¼	12¾-13¼	12½-12¾
Grade 3, 66-70, 450 end point i. b. p. not less than 70	12¾-13¼	12¾-13¼	12½-12¾

BURNING OILS

PENNSYLVANIA			
45 Water White	5½-5¾	-5¾	5½-5¾
46 Water White	6½-6¾	-6¾	6½-6¾
47 Water White	7½-7¾	7½-7¾	7 -7½
300 Burning Oils	-7	-7	6½-7
OKLAHOMA			
41-43 Prime White	3½-3⅝	3⅜-3⅝	3⅜-3½
42-43 Prime White	3⅝-3¾	3⅝-3¾	3½-3¾
44-46 Water White	4½-4¾	4½-5	4 -4¼
42-43 Distillate	3½-3⅝	3½-3⅝	3¾-3½
45-47 Distillate 510 E. P.	6 -6¼	5¼-5¾	6 -6¼
46-48 Distillate 480 E. P.	6½-6¾	6½-7	6½-6¾
NORTH TEXAS			
40-42 Prime White distillate	2¼-3	2½-3	2¾-3¼
41-43 Prime White Kerosene	2¾-3¼	2¾-3¾	2¾-3¼
41-43 Water White Kerosene	3 -3½	3 -3½	3 -3½

NEUTRAL OILS

PENNSYLVANIA	Prices Feb. 27	Prices Feb. 20	Prices Jan. 30
(Viscous test 70)			
200 Vis. No. 3. Assoc. Filt	21½-22	20 -21	18½-19
180 Vis. No. 3 Assoc. Filt	20 -21	18 -19	16½-17
150 Vis. No. 3 Assoc. Filt	16 -18	16 -16½	14½-15
(Non-Viscous)			
34 350-360 Flash	7 -7½	6½-7	-6½
36 Miners Neutrals 300-305 Flash	6½-7	6¾-6½	6½-7
OKLAHOMA			
(Viscous test 100)			
100 Vis. at 100° F. No. 2 Color	6 -6½	6 -6¼	6½-7
100 Vis. at 100° F. No. 3 Color	5¾-6	5¾-6	6 -6½
200 Visc. at 100° F. No. 3 Color	11½-12	11½-12	11½-12
150 Vis. at 100° F. No. 4 Color	8½- 9	8¾- 9	9 - 9½
200 Vis. at 100° F. No. 4 Color	11 -11½	11¼-11½	11¼-11¾
200 Vis. at 100° F. No. 5 Color	10¾-11¼	11 -11¼	11 -11½
285 Vis. at 100° F. No. 6 Color	14 -14½	14¼-14½	14 -14½
SOUTH TEXAS			
(Viscous test 100; cold test 0)			
100 Vis. No. 2 Color Unfilt. Pale	6 - 7	5½- 7	6 - 7
150 Vis. No. 2½ Color Unfilt. Pale	9 -10	9 -11	9 -11
200 Vis. No. 3 Color Unfilt. Pale	11 -13	11 -13	11 -13
300 Vis. No. 3 Color Unfilt. Pale	15½-17	15½-17	16 -17½
500 Vis. No. 3½ Color Unfilt. Pale	20 -22	19 -21	19 -21
750 Vis. No. 4 Color Unfilt. Pale	29 -30	29 -31	29 -31
150 Vis. No. 1½ Color Filt. Pale	-23½	-23½	-23½
200 Vis. No. 2 Color Filt. Pale	-28½	-28½	-28½
300 Vis. No. 2 Color Filt. Pale	-33	-33	-33
500 Vis. No. 2½ Color Filt. Pale	30 -35½	30 -35½	30 -35½
750 Vis. No. 2½ Color Filt. Pale	40 -43½	40 -43½	40 -43½
200 Vis. No. 5½ Color Red Oil	9½-11	9½-11	10 -12
300 Vis. No. 5½ Color Red Oil	13 -15	13 -15	14 -15
500 Vis. No. 6 Color Red Oil	16½-18	16½-18	17 -19
750 Vis. No. 6 Color Red Oil	27 -28	27 -28	27 -28

CYLINDER STOCKS

PENNSYLVANIA			
600 Steam Refined	11 -11½	11 -11½	10½-11
635 Steam Refined	13½-14½	-12½	13 -14
650 Steam Refined	15½-16	13½-16	14½-15½
600 Flash	-20	-20	18½-19
600 Warren E.	19 -19½	19-19½	-18½
600 Oil City E	16 -16½	16-16½	15 -16
600 Medium Filtered (D)	-24	-24	-22
Cold Test Stocks (bright filtered)	-38	-38	38 -40
Cold Test Stocks (dark filtered)	-35	-33	35 -37
Black Oil	- 6½	- 6½	6½- 7

WAX

PENNSYLVANIA			
(Per Pound New York)			
122-124 White Crude Scale	-2¼	- 2¼	- 2¼
124-126 White Crude Scale	-2½	- 2½	- 2¾
OKLAHOMA			
122-124 White Crude Scale	1¾- 2	1¾- 2	1¾- 2

FUEL OIL

PENNSYLVANIA			
36-40 Fuel Oil	- 4	- 4	- 4
OKLAHOMA			
32-36 Gas Oil (Gal.)	2½- 2⅝	2¼- 2¼	2¼- 2¼
24-26 Fuel Oil (bbl.)	85 -.95	.90-1.00	.75- .80
Fuel Oil, buyers cars (bbl.)	87½-.95	.90-1.00	.75- .80
NORTH TEXAS			
38-40 Straw Distillate	2½- 3	2¾- 3	- 2¾
36-38 Gas Oil	2½- 2¾	2¼- 2¾	
32-36 Gas Oil (gal.)	2¼- 2½	2¼- 2½	2¼- 2¼
24-26 Fuel, per bbl.	.70- .75	.70- .80	.75- .80
26-30 Fuel, per bbl.	.75- .85	.80- .90	.80- .90
South Texas Fuel	1.00-1.10	1.00-1.10	1.10-1.20

Tank Wagon, Service Station Markets

Gasoline and Kerosene

BELOW are given in cents a gallon service station and tank wagon quotations on gasoline and tank wagon quotations for kerosene, as quoted by the Standard Oil Companies, the points at which prices are given being arranged by Standard Oil marketing districts. By tank wagon price is meant the price to reselling agents and not the price from the tank wagon to consumers.

S. O. NEW JERSEY DISTRICT

	Gasoline T.W. Feb. 27	Gasoline S.S. Feb. 27	Oil T.W. Feb. 27
Atlantic City, N. J.	23	25	12
Newark, N. J.	23	25	12
Annapolis, Md.	23	25	11.5
Baltimore, Md.	22	24	10.5
Washington, D. C.	22	24	11
Danville, Va.	22	24	12.5
Norfolk, Va.	22	24	11
Richmond, Va.	22	24	11
Roanoke, Va.	23	25	13
Petersburg, Va.	22	24	11.5
Charleston, W. Va.	23	25	12
Keyser, W. Va.	23	25	11.5
Parkersburg, W. Va.	21.5	23.5	10.5
Wheeling, W. Va.	22	24	12
Charlotte, North Carolina*	22.5	24.5	12
Hickory, N. C.	23	25	10.5
Mt. Airy, N. C.	23	25	12.5
Salisbury, N. C.	23	25	12.5
Charleston, S. C.	19.5	21.5	10
Columbia, S. C.	21.5	23.5	12

S. O. NEW YORK DISTRICT

†New York, N. Y.	24	26	14
Albany, N. Y.	24	26	14
Buffalo, N. Y.	20	22	14
Boston, Mass.	24	26	16

Note—The official tank wagon price of gasoline as quoted at 26 Broadway and at the Albany office by the Standard of New York is 24 cents. However the above figures at Albany and Buffalo are those at which the Standard is actually selling gasoline to dealers at the points designated.
†Note—Prices in Steel Barrels.

ATLANTIC REFINING DISTRICT

Pittsburgh, Pennsylvania*	23	26	14
Philadelphia, Pa.	23	26	14
Dover, Del.	23	26	14
Wilmington, Del.	23	26	14
Procidence, R. I.	24	27	15
Springfield, Mass.	24	27	15
Worcester, Mass.	24	27	15
Hartford, Connecticut*	24	27	15
New Haven, Conn.	24	27	15

Note—The five New England towns named above are the principal Marketing points in Atlantic Refining Company's New England territory. S. O. New York also markets at these points.

S. O. OHIO DISTRICT

Cleveland, Ohio	22	23	14

Note—Tank wagon markets at all points in Ohio are the same as for Cleveland.

S. O. KENTUCKY DISTRICT

Lexington, Kentucky*	22	24	12
Louisville, Ky.	21	23	12
Covington, Ky.	21	23	13.5
Jackson, Mississippi*	20.5	22.5	12.5
Natchez, Miss.	20	22	12.5
Vicksburg, Miss.	20	22	12.5
Birmingham, Alabama*	22	24	14
Mobile, Ala.	19	21	12.5
Montgomery, Ala.	21	23	14.5
Atlanta, Georgia*	23	25	14
Augusta, Ga.	22	24	14
Macon, Ga.	22	24	14
Savannah, Ga.	20	22	12
Jacksonville, Florida*	21	23	12
Miami, Fla.	24	26	15
Tampa, Fla.	21	23	12

S. O. LOUISIANA DISTRICT

Camden, Arkansas*	20	23	13
Little Rock, Ark.	20	23	13
Alexandria, La.	20	23	12
Baton Rouge, La.	18.5	21.5	10.5
Lake Charles, La.	20.5	23.5	12.5
New Orleans, La.	19.5	22.5	10
Shreveport, La.	20	20	12
Bristol, Tenn.	25	28	15
Chattanooga, Tenn.	21	24	14.5
Knoxville, Tenn.	21.5	24.5	15
Nashville, Tenn.	20	23	13
Memphis, Tenn.	19.5	22.5	12.5

MAGNOLIA PETROLEUM DISTRICT

	Gasoline T.W. Feb. 27	Gasoline S.S. Feb. 27	Oil T.W. Feb. 27
Muskogee, Ok.	18	21	11
Oklahoma City, Ok.	18	21	10
Tulsa, Ok.	16	19	11
Fort Smith, Ark.	20	23	12
Little Rock, Ark.	20	23	13
Pine Bluff, Arkansas*	20	23	13
Texarkana, Texas.	20	23	13
Amarillo, Texas.	19	22	13
Dallas, Texas.	18	21	19
El Paso, Texas.	20	23	15
Fort Worth, Texas.	18	21	10
Galveston, Texas.	19	22	12
Houston, Texas.	18	22	12
San Antonio, Texas.	17	20	12

S. O. INDIANA DISTRICT

Chicago, Ill.	19.5	21.5	11.5
East St. Louis, Ill.	18.45	20 7	11.1
Evansville, Ind.	20.6	21.6	12
Indianapolis, Ind.	20.8	21.8	12.2
Fort Wayne, Ind.	21	22	12.4
Bay City, Mich.	21.5	22.5	12.6
Grand Rapids, Mich.	21.1	22.1	12.4
Detroit, Mich.	21.2	22.2	12.5
Battle Creek, Mich.	20.9	21.9	12.2
St. Louis, Mo.	19.9	21.9	11.2
Kansas City, Mo.	19.2	20.2	10.5
Topeka, Kansas.	20.1	21.1	11.1
Whichita, Kans.	20.3	21.3	11
Des Moines, Ia.	21.1	22.1	12.4
Keokuk, Ia.	21.1	22.1	12.1
Sioux City, Ia.	21.1	22.1	12.4
La Crosse, Wis.	22	23	13.1
Milwaukee, Wis.	20.9	21.9	12
Madison, Wis.	21.1	22.1	12.2
Minneapolis, Minn.	21.7	22.7	13
Pipestone, Minn.	21.7	22.7	12.9
Aberdeen, South Dakota*	23.5	24.5	13.5
Sioux Falls, S. D.	21.9	22.9	12.9
Bismarck, N. D.	26.1	27.1	16.3
Fargo, N. D.	24.5	25.5	14.7
Grand Forks, N.D.	24.8	25.8	15
Minot, N. D.	26.8	27.8	17
Bartlesville, Ok.	19.5	20.5	10.7

S. O. NEBRASKA DISTRICT

Crawford, Neb.	20.5	21.5	13.75
Omaha, Neb.	20	22	12.5

CONTINENTAL OIL DISTRICT

Denver, Colorado*	21	23	15
Glenwood Springs, Colo.	26	28	20
Pueblo, Colo.	21	23	15
Basin Wyo.	20	†	14.5
Casper, Wyo.	17.5		12.5
Cheyenne, Wyo.	20		14
Cody, Wyo.	22		16.5
Lander, Wyo.	20		15
Billings, Montana*	23.5	25.5	16.5
Butte, Mont.	24.5	26.5	18.5
Great Falls, Mont.	25.5	27.5	18.5
Helena, Mont.	25.5	27.5	18.5
Miles City, Mont.	25.5	27.5	18.5
Ogden, Utah	25.5	27.5	17.5
Salt Lake City, Utah	25.5	27.5	17.5
Boise, Idaho	25.5	27.5	20
Albuquerque, New Mexico*	25	27	16

†Note—Continental Oil Co. Maintains no filling stations in Wyoming.

S. O. CALIFORNIA DISTRICT

Phoenix, Arizona*	26.5	28.5	21
Los Angeles, Cal.	21	23	14.5
Fresno, Cal.	21.5	23.5	17
San Francisco, Cal.	21	23	14.5
Reno, Nev.	25	27	18.5
Portland, Oregan*	24	26	15.5
Seattle, Washington	23	25	15.5
Spokane, Wash.	27	29	20
Tacoma, Wash.	23	25	15.5

*Note—Besides the inspection fees collected from oil marketers, which vary from one eighth of a cent to 1 cent and a half a gallon in different states, 14 States levy an additional tax on gasoline, usually for road purposes. In Oregan and New Mexico the tax is 2 cents a gallon. It is 1 cent a gallon in Arizona, Arkansas, Colorado, Florida, Georgia, Kentucky, Montana, North Carolina, South Dakota and Washington. It is included in the tank wagon price in those states. In Pennsylvania and Connecticut, the 1 cent road tax is collected separately.

S. O. Of New Jersey Cuts Kerosene Cent

NEW YORK, Feb 26.—On Friday Feb. 26, the Standard Oil Co., of New Jersey announced a reduction of 1 cent per gallon in the tank wagon prices of kerosene in the various states in its Baltimore division. The state of New Jersey price remained unchanged.

* * *

PHILADELPHIA, Feb. 27.—The Atlantic Refining Co., effective Feb. 21 increased the price of kerosene 1 cent a gallon throughout the New England territory

Mines Bureau Working To Get Better Blend

By Special Correspondent

WASHINGTON, Feb. 25.—D. B. Dow of the Bartlesville experiment station of the Bureau of Mines has begun an investigation of blended products containing natural gas gasoline. At present the natural gasoline manufacturers are having difficulty marketing their product, because of the over-production of gasoline, and because of prejudice against natural-gas gasoline blends. Mr. Dow is conducting a series of experiments with various types of blending material in connection with high and low stage compression gasoline. By proper selection of blending material and use of the proper amounts of natural-gas gasoline, it may be possible to produce a mixture with characteristics similar to those of "straight run" products. A study is being made by the Bureau of Mines of the relation between vapor pressures and rates of evaporation for straight-run and blended products.

Report To Be Made On Still Vapor Gasoline

By Special Correspondent

WASHINGTON, Feb. 25.—The investigation relating to the recovery of gasoline from uncondensed still vapors has been completed and a report is being prepared by the Bureau of Mines. Practically all the refineries in the country that have installed equipment for obtaining gasoline from still vapors have furnished data on the type and process used, whether compression or absorption, the amount and nature of the vapors handled, the yield and quality of gasoline recovered, and other points.

Many refineries throughout the country do not recover gasoline from still vapors, but it is believed that knowledge of the large amounts of gasoline to be obtained in this way will lead to the erection of more recovery plants.

NEW YORK, Feb. 25.—According to William N. Best, petroleum engineer, in his new book "Burning Liquid Fuel," 29 gallons of fuel oil are wasted in the production of each ton of steel. The book recently was published by the U. P. C. Book Co.

Western Refiners Don't Expect Gasoline Above 14 Cents In March

Staff Special
TULSA, Feb. 27.

FROM the trend of inquiries reaching the Mid-Continent refined oil market the early part of this week and from the attitude of the refinery sales managers towards those inquiries, the conclusion might be reached that navy gasoline will hang fairly close to the 14 cent mark over March, unless an export demand developes, which has been lacking the past few weeks.

If the weather conditions prevail over the month similar to what the country is now experiencing, it is even possible that the price may drop below 14 cents. There are not many refiners that are actively in the market to sell gasoline, either for spot movement or over the next 20 or 30 days. The big plants are more intent on storing their output against the real opening of the spring demand than moving the bulk of their output now.

With the larger number of plants that are shut down or moving stuff under contract, the output of gasoline that is available on the market is definitely limited. Against this limited supply, however, must be put the light demand for domestic consumption that is likely to be a factor over the entire month. It is very rare that real spring demand for motor fuel is felt before April and the majority of the Mid-Continent refiners are preparing to pass March under about the same price conditions they have been facing the past few months.

Exports Uncertain

The real uncertain factor in the Navy gasoline market the next few weeks, as far as can be foreseen now, is the export situation. Up to this time, what demand has come for Navy gasoline from export channels, has been taken care of, with the exception of one or two shipments, by the Union Petroleum Co. This company's purchases of Navy gasoline have been negligible as compared with their heavy buying of the 64 gravity export grade. It is not now buying Navy for export. If it does, or if some other agency comes into the Mid-Continent market to fill an export order, it likely will be reflected in an advance in the price, inasmuch as the output is curtailed. There have been rumors and reports from other quarters that such orders might be forthcoming, but nothing tangible has developed yet.

In this connection a great deal of interest has been manifested the past few days in the report which was current here that the export plant of the Carson Petroleum Co. at New Orleans has been sold to H. L. Doherty oil interests, operating refineries in the Mid-Continent district as the Empire Refineries, Inc.

This report has not been confirmed here, but it is known that the Doherty interests have been negotiating for some time for this plant. The acquisition would give them an export plant on the Gulf as well as the present export facilities of the Crew Levick Co., at Philadelphia.

With the present extensive refinng capacities of the Empire plants, it would engage in the export trade on the strength of its own plant output. It is possible, though, that it might decide to follow its present practice of buying on the market instead of manufacturing, while the present low level of refined products is maintained, and thus it might become a factor in the export trade in this district.

Crude Oil Prices

The crude price situation remains just about where it was a few weeks ago, with possibly an increase in the amount of Oklahoma and Kansas crude surplus, but with the principal companies evidently desirous of maintaining the present price for light Mid-Continent crude, if it can possibly be done.

The past week has seen concrete evidences of an attempt to curtail the crude output in such flush areas of the Mid-Continent district as El Dorado Ark., and Haynesville. It is likely that there may be other attempts of this nature, in cluding perhaps Mevxia and even the flush Gulf coast pools, without an attempt to put similar drastic measures into effect in the light oil districts of the Mid-Continent field. It is estimated that there is a surplus crude production at present in the whole Mid-Continent field of around 135,- barrels a day. In Oklahoma alone there is probably 50,000 barrels of crude a day that now goes as surplus, but would be included in refinery runs in the state were refinery operations at normal. Imports of Mexican crude are mountig also.

It must be borne in mind, however, that the general crude surplus in the entire country represents mainly crude with a very small gasoline content and it is the crude with a good gasoline content that is in demand from refiners and will be increasingly in demand as the spring and summer months come on.

Oklahoma and Kansas output, chiefly of light crude, is around 415,000 barrels a day now. Last summer it reached at one time 450,000 barrels a day and crude stocks were drawn on during the fall months. It is safe to assume that domestic consumption of gasoline will show an increase this year over last, since motor vehicle registrations show an increase of a little better than 10 per cent.

Facing this condition it is reasonable to assume that there will be need of all the light crude the Oklahoma and Kansas and north Texas districts can produce before the summer is over.

Refinery Statistics

The Bureau of Mines refinery figures for December, just come to hand, show Mid-Continent gasoline stocks as of the end of the year at 84,933,000 gallons or something better than 1,600,000 barrels. These figures are too old to give an index to the present situation as regards stocks. It has recently been estimated that gasoline stocks in the two states amount to around 1,200,000 barrels now. They have not been cut down within the last month, but they are held by the strong companies and do not represent, for the most part, any surplus which is to be thrown on the open market. Gasoline output in Oklahoma and Kansas during

(Continued on page 105)

Market For Pennsylvania Products Stimulated; Prices Are Stiffer

Staff Special
CLEVELAND, Feb. 27.—There was a marked upward tendency in the prices of refined products at the western Pennsylvania refineries during the past week, due not only to the constantly decreasing supply of products but also to much more active buying of most products than has been seen for many weeks. The enlivened interest was especially apparent in the case of the napthas, gasoline and neutrals.

Jobbers during the past week showed a lively interest in gasoline and did considerable buying at the spot market. The unwillingness of the refiners, which has been evident for the past two or three weeks to enter into any long time on the basis of present prices of gasoline, has had the effect of stimulating the interest of the jobber who has not made his arrangements for a gasoline supply during the summer. The eastern refiners for the most part are still holding their runs down to the minimum and there are very small stocks of all products.

Even with the advancing prices, some of the refiners are not quoting and are running their products to storage. It is the universal opinion that prices will go up during the late spring and summer to a point that will make a profit for the refiner. General opinion is that there will be no cuts in Pennsylvania crude, and that the advance in the demand for refined products will be sustained enough to keep crude from piling up in storage to the point where a cut will be necessary from the standpoint of the purchasing companies.

Fuel oil, kerosene and wax are the three products that show the least activity and the market for cylinder stocks is strengthening very slowly. So slowly in fact that the upward trend of prices seems to be due more to the fact that less and less is being offered than to an increase in the demand.

Wax, which depends almost wholly on the export demand to keep the market in a healthy condition, is very quiet, the demand being practically non-existent. Fuel oil remains about the same as a week ago, the continued slack demand having a tendency to soften the price. Kerosene also has shown a declining rather than an ascending tendency during the past week.

Kentucky

The slow demand for kerosene at the Pennsylvania refineries is probably in large measure due to the activity of the Kentucky refiners in marketing their burning oil. Kerosene stocks in Kentucky are cleaned out and the kerosene being currently manufactured is moving right from the refinery. Kentucky refiners are shipping much kerosene into Virginia, North and South Carolina, some into southern Ohio and considerable into New York State.

Gasoline also is moving well from Kentucky plants, new Navy bringing from 15½ to 16½ cents. There are no stocks of gasoline in the refiners' tanks either. Fuel oil is being mostly run to storage but it could be sold at 3 cents a gallon, an increase of about half a cent from the prices prevailing for the preceding two or three weeks. The refiners, however, are unwilling to sell at present offered prices and are confident that the market will be better within the next month or two.

Gasoline For Export Is Higher
Big Lub Order Going Overseas

By Special Correspondent
NEW YORK, Feb. 27

WITH sterling exchange at the highest point in many months and gasoline as well as several of the other petroleum products showing indications of advancing, considerably export business developed last week, and the position of the market in general was firmer than it has been in some time. Several cargo sales of gasoline and kerosene came to light, while several prominent refiners are negotiating for the sale of three cargoes of gasoline, one of kerosene and one of gas oil. Gasoline advanced materially but kerosene, if anything, is a little lower. Some of the lubricants are firmer.

Business is better than a month ago. It is no longer difficult to locate a cargo sale; in fact, large turnovers are much more frequently reported, and undoubtedly considerable business has gone over that the parties involved have for unexplained reasons, kept quiet. The movement abroad on new contracts has improved, and the fact that many of the larger refiners are shipping good sized quantities on consignment, has created the belief that the surplus of petroleum products in general will not be long lived.

The chartering of vessels for cargo shipments of petroleum has not been particularly heavy, but the larger companies are, in many instances, operating their entire fleets and a few chartered vessels also. Reports emanating from European centers indicate the consumpiton of the various petroleum products is gaining rapidly, due to the steady improvement in industrial conditions there.

Reports of several of the larger oil companies, indicate the French were the most active buyers in the New York market during the week. Of course the English have been taking a little oil but apparently the need in France is more urgent. German buyers were again inquiring in a very active fashion, and some oil is said to have been purchased by exporters with German connections. Italian importers are manifesting a keener interest but the demand from this quarter has been rather disappointing of late. However, a little oil is still going to Spain, Belgium, and the Far East.

A good many of the smaller refiners in the East, especially those in possession of gasoline, show much more disposition to hold back, and there is not a great deal of gasoline being offered around. In fact, high gravities are very scarce. Cylinder stocks reflect this condition to a certain extent, while white crude scale wax has also firmed up quite a little of late. On the other hand, bunker oil has softened and is largely nominal. Gas oil is also a little easier, but not quite as weak as bunker oil.

A large percentage of the trading reported last week was direct between big refiners and buyers, wtih comparatively few brokers in on the large turnovers. Fewer "Broadway" inquiries have come to light. Sentiment among brokers, however, is more optimistic, and the small lot demands both for domestic and foreign account have again increased in number. A few weeks ago the broker was doing practically nothing. However, there is enough going on now to keep the live ones moving.

Gasoline

Gasoline is stronger and higher than it was a week ago although the leading refiners have not as yet announced any fluctuations. A week ago, the asking price for new navy gasoline in bulk, delivered New York, was 17¾ to 18 cents. Now, however, it is practically impossible to locate anything below 18¼ cents while some are asking as high as 19¼ cents. In fact, there is comparatively little to be had at the aforementioned inside figure, and a bid of 18¼ cents for 25 cars was just about accepted. Many of the local observers are predicting that the upward swing will continue until late next fall. These predictions, however, are usually heard with the slightest indication of higher prices, although it is admitted even by those bearishly inclined that the outlook is far brighter than it has been in many weeks, due chiefly to the closing down of refineries. In addition to many small trades two cargo sales of gasoline, to Europe, probably France, were reported. One of these deals called for 65,000 barrels; the size of the other was not made public. Negotiations are going on, according to reports, for the sale of three more cargoes of gasoline, two of which are expected to go over.

Kerosene

While kerosene is softer, the export movement is fair considering circumstances, and two cargo sales of 65,000 barrels each were reported. It is believed a French importer was on the purchasing end. Cased goods is still coming in for a steady demand, but sales are confined to lots of 2,000 to 5,000 cases, in bulk, delivered New York. Water white 45-150 can now be had at 7¾ cents a gallon against 8 cents the previous week. Prices as quoted by leading refiners have not changed.

Gas and Fuel Oils

Bunker oil is now available at $1.10 a barrel, f. a. s. New York. Most of the leading refiners are asking $1.16½ a barrel but this price is largely nominal. There is little or no buying reported, although inquiries from marine interests have been far more numerous. Steel manufacturers show a keener interest but export business is sluggish and while several good sized deals are pending, no actual trades of consequence have been reported. Most of the sales reported were for rather small quantities, ranging from 3,000 barrels to 10,000 barrels. Gas oil is dull. One of the large Independents is working on a cargo order, involving about 31,500 barrels, but no dealings worthy of special mention have been heard of. The local price is held around 4½ cents a gallon, New York, consumers are apparently well covered for the immediate future and are not showing much interest.

Lubricants

Small lot trading is much more spirited and the market in general has stiffened a little. However, no bulk sales have been reported, although as in gas and bunker oil, negotiations for a cargo of around 35,000 barrels are in progress. France is said to be buying a good deal of the lubricating oil. For 600 S. R. the asking price is listed at 18¼ cents with little available at the old price of 18 cents. Some factors are asking 18½ cents a gallon in barrels, New York. Black oil is dull. Pale oils are moving more freely. One of the large local refiners, closed a deal in lubricating oils, involving 63,000 barrels of assorted oils. This is the largest sale in these oils reported in

New York Market

The following represent prices quoted by eastern seaboard Independent refiners on products which are manufactured almost entirely from Mexican crude transported from Tampico to the refinery by tanker. These products are being sold to an increasing extent to jobbers in New York territory.

*Gasoline (New Navy) gal.	18½–19
‡Bunker oil (F. A. S. New York) bbl.	$1.10–1.16½
Gas Oil (36–40 refinery) gal.	4½
Kerosene, 45-150 W. W. Bulk Del N. Y.	.07¾
Cylinder, 600 S.R. Bbl. N.Y.	18¾–18½

*Delivered
‡Nominal

Export Markets

The following export quotations are those of the New York Produce Exchange, which are furnished by the export departments of the Standard of New Jersey and the Tide Water Oil Companies.

Illuminating Oils

Quotations are based on the following quotations: Bulk, tank, steamers, barrels; cargo lots, about 50,000 barrels; cases cargo lots averaging about 100,000 cases. Quotations are for standard white 110 flash test.

S.O.N.J.	Feb. 27	Feb. 20
Bulk, gal., Bayonne	7.00	7.00
Barrels, gal., Bayonne, cargo	13.00	13.00
Cases gal. Bayonne	17.50	17.50

Prices for water white oil (150 test) are 1 cent higher than those for standard white.

GASOLINE-NAPTHA
(Cents per Gallon)

Standard New Jersey, f. o. b. Bayonne

U. S. Navy, bulk	17.00	17.00
U. S. Navy, cases	31.25	31.25
Export grade, bulk	18.50	18.50
63–66 deg. bulk	21.50	21.50
66–68 deg. bulk	22.50	22.50

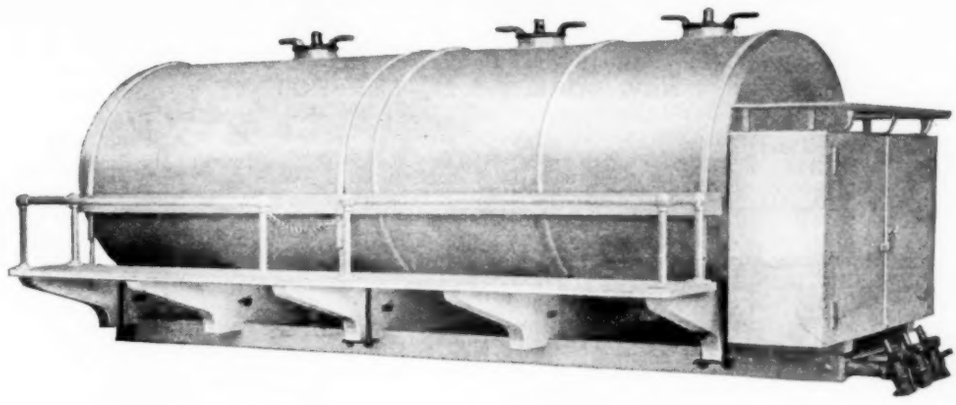
Tide Water Oil Company
f. o. b. Bayonne)

59–61 deg. bulk	17.50	17.50
59–61 deg. cases	31.25	31.25
Export grade, Navy Specifications, bulk	17.00	18.00
63–65 deg. bulk	20.25	20.25
68–72 deg. bulk	22.50	22.50

Kerosene	Bulk	Barrels	Cases
Standard white 110	7.00	13.00	17.50
Water white 150	8.00	14.00	18.50

The Texas Company

Gasoline, cases		31.25	31.25
Kerosene	Bulk	Barrels	Cases
Standard White	7.00	13.00	17.50
Prime White	7.50	13.50	18.00
Water White	8.00	14.00	18.50



WELDCO Truck Tanks

Distribute the Load Evenly

"Drains Like a Funnel"

WELDCO TRUCK TANKS

THE engineering principle of Weldco Truck Tank construction is designed so that the load is evenly balanced without undue strains on the truck, thus lengthening its life.

A Weldco drains to the last drop regardless of the position of the truck. It automatically cleans itself, thus saving time, material and money. No water can accumulate due to the drain device.

Weldco Truck Tanks are electrically welded—rugged to the last detail—and are guaranteed leak-proof. All joints are designed to withstand great stresses and side strains. Head and partition joints defy wear and tear. Any number of compartments can be used.

Built in round, elliptical and semi-rectangular types, equipped with can box and racks, these tanks have gained immediate popularity. They are shipped complete, with sturdy oak bed, ready to mount on chassis. A coat of first quality base lead paint is a part of specifications.

Write for literature and price list. State capacity tank and make of truck.

The Youngstown Welding Co.

Youngstown, Ohio

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many weeks. The order calls for immediate shipment, which will probably be made out of one of the Gulf ports.

Waxes and Petrolatums

There is more doing in the waxes but the petrolatums are quiet and devoid of new feature. Prices are holding up well. For white crude scale, 122-24 A. M. P., the asking price is well maintained around 2¼ cents with little or nothing available at the old price of 2⅛ cents in slack barrels f. a. s. New York.

Match wax is scarce while fully refined grades are moving in a routine way at unchanged prices. Snow white petrolatum is still quoted at 12 cents with little business in any of the other grades.

Tankers

No important changes were reported in marine schedules of the leading oil companies.

Hold up Action On Bill Ending Oil Inspection

By Special Correspondent

LEXINGTON, KY., Feb. 27.—The Vest bill which would abolish the office of county oil inspector in Kentucky, has been recommitted to committee and may not again be called out this session of the legislature as the affairs of both houses are now in the hands of the rules committees.

The Vest bill has been the cause of many tilts in the legislature at Frankfort. Many amendments and substitutes have been offered for it, one of them which would regulate the salaries of oil inspectors to a maximum of $3,500. An oil inspectorship, which is compensated by a fee system, is one of the choicest political plums in Kentucky. It is currently reported that one of these jobs is worth up to $40,000 a year and that the salary regulatory bill is aimed at an inspector who has been obtaining this much. It, however, would not obliterate the oil inspection graft.

Representative Vest who has been tireless in his efforts to end this inspection evil succeeded on Feb. 17 in getting his measure called before the house as special business. After many amendments, the offering of substitutes and the usual parliamentary filibustering, a motion to recommit the measure was carried 45 to 43.

The bill placing the pipe lines of the state under the supervision of the Railroad Commission, and which passed the Lower House and was submitted to the Senate Committee on Public Roads and Highways, was argued before this Committee last week by officers and members of Kentucky Oil Men's Association. The committee did not report the bill out for passage and as the rules committee is now in charge, the association, which is opposing the bill, feels that it is a dead issue.

NEW YORK, Feb. 24.—Notice has been given by the White Oil Corp. that it will issue $1,500,000 of 8 per cent preferred stock and 1,000,000 shares of common stock. Part of this will be used to finance the acquisition of the oil properties of the United Central Oil Corp., subsidiary of the United Gas & Electric Corp.

Linseed Oil Is Firm; French Buying Benzol

By Special Correspondent

NEW YORK, Feb. 27.—Linseed Oil held firm but turpentine was slightly lower. Considerable export business in benzol has been going on although the prices being paid have been kept secret. The chemical movement was a little less active with comparatively few sizable dealings reported.

Featuring the benzol market was the sale of 900,000 gallons for export to France at a price said to be about 4 or 5 cents over the prevailing market. There is less disposition to sell, and the tone of the market is even firmer than it was a week ago, with sellers asking 29 to 35 cents for pure, and 27 to 33 cents for 90 per cent, these prices being for contracts. Consumers find difficulty in locating stocks, and producers are still way behind in their deliveries.

Chemicals

The demand for imported bleaching powder was less active last week, and offerings were heard of at $1.90 a hundred pounds ex dock. Buyers were inclined to believe that business could have been done at as low as $1.80. Domestic bleaching powder was offered in large drums at $2.00 while small drums held at $2.25. Caustic soda was fairly active and export business was put through at $3.25 to $3.30 a hundred pounds, February shipment. March was held at $3.20. Producers were asking $2.50 for 60 per cent. f. o. b. works. The demand for soda ash was sluggish. Few carlot sales were heard of during the week. Sales in large quantities were reported at as low as $1.65 to $1.70 a hundred pounds. Small sales were reported to have been made at as low as $1.80 to $.90 a hundred pounds ex store. Producers were asking $1.27½ to $1.47½ a hundred pounds.

Oils and Naval Stores

Linseed oil was slightly softer. One of the leading crushers is offering at 84 cents a gallon raw oil in carlots but most of the crushers are still asking 86 cents a gallon. There has been very little stirring in the linseed oil market in some time. Soya bean oil is dull and nominally unchanged at 9 cents a pound in barrels on spot. There was a little better inquiry for perilla oil and the market was firmly maintained at 12 cents, barrels, spot. Naval stores were a little softer. Spirits of turpentine eased off from 91½ cents, the price of the previous week to 89½ cents a gallon, barrels, ex yard. Rosins were quiet.

Refiners' and Jobbers' Supplies

Following are the average market prices for the week on the principal materials used by refiners and obbers, f. o. b. shipping point as effective this date.

Benzol

	Feb. 27	Feb. 20
Pure Water White,	29-35	29-35
90 Per Cent	27-33	27-33
†Spot, 90 Per Cent	40	40

Refiners' Supplies

Soda Ash, light	$1.65-1.90 cwt.	$1.65-2.00 cwt.
Silcate of Soda 60 deg.	2.20 cwt	2.20 cwt.
Sal. Soda	1.40-1.80 cwt.	1.45-1.80 cwt.
Caustic Soda 76%	3.45 cwt.	3.80-3.50 cwt.
Sulphuric Acid 60 deg. tank cars f. o. b. sellers' shipping point	10.00-11.00	—10.50—11.00

Jobbers' Supplies (Open Market)

English Degras	3¾c lb.	3¾c lb
Domestic Degras, bbls, carloads	3¾c lb.	3¾ b
Chloride of Lime	$2.00-2.25 wt 2.00	$2.25 cwt.
Horse Oil	5½c lb.	5½c lb.
Lard Oil—		
Ex. Winter strained	$ 87 gal.	$ 87 gal.
Extra No. 1	72 gal.	.72 gal.
No. 1	67 gal.	.67 gal.
No. 2	65 gal.	.65 gal.
Prime Packer Tallow cases f.o.b New York	.7½ gal.	
Edible Lard Oil	92 gal.	
Tallow Oil acid less	.72gal.	.72 gal.
Neatsfoot Oil—		
Cold pressed	$1.30 gal.	1.30 gal.
Pure	1.17 gal.	1.17 gal.
Menhaden Fish Oil—		
Light pressed	.49 gal.	.49 gal.
Brown	.43 gal.	.43 gal.
Yellow bleached	.53 gal.	.43 gal.
Whale Oil—		
Extra winter bleached	75- 72 gal.	
Soya Bean Oil Spot NY bbls	†.09c lb.	8¼c lb.
Herring Oil, tank cars coast	34-	33 gal.
Seal Oil		Nominal
Linseed Oil	84 86 gal.	80 bbl.
Rosin B. N. Y.	5 30 bbl.	5 30 bbls.
Rosin F. N. Y.	5 35 bbl.	5.35 bbls.
*Rosin B	4 00 bbl	4 02½ bbl.
*Rosin F	4 00 bbl.	4 02½ bbl.
Rosin Oil 1st run	.36 gal.	36 gal.
Rosin Oil 2nd run	.39 gal.	39 gal.
Turpetine, N. Y.	89½gal.	91½ gal.
*Turpentine	.85½gal.	84½ gal.
Pine tar—		
Kiln Burnt, bbls	$10 00	$10 00
Retort Tar, bbls	9 00	9 00

*Savannah, Ga market
†Nominal

May Take Over Tankers

NEW YORK, Feb. 24.—The United States Shipping Board is preparing to take over and operate for its own account the tanker fleet now allocated to managing agents and employed in bringing crude oil from Mexico to Atlantic coast refineries, according to newspaper reports received here. This marks a reversal of the board's policy which has been to charter or allocate for operation to private firms acting as agents and solely charged with management of the vessels. McAllister Bros., Walker & Daley and the Columbus Shipping Co. are the agents concerned.

Experiment Station Enlarged

WASHINGTON, Feb. 25.—An experimental refinery consisting of three 1-barrel stills and one 5-barrel still, condensers, run-down tanks, and other fixtures has been constructed by the Bureau of Mines at the Bartlesville station, and is now being used in work on refining problems. Use was made of this refinery in investigating the recovery of gasoline from still vapors and the production of special products for blending with natural-gas gasoline. The refinery was also used in producing residuums as a source of cylinder stocks for work being done by one of the larger refining concerns. The refinery will be used in connection with the investigation of fractionating towers, and will later be equipped for studies of lubricating oils.

CRUDE OIL PRICES

EASTERN FIELDS

	1922 Feb 27	1921 High	1921 Low	1920 High	1920 Low
Pennsylvania	$3.25	Jan. 1...$6.10	June 29...$2.25	Mar. 2..$6.10	Jan. 1.....5.02
Cabell	2.11	Jan. 1....4.46	June 29....1.11	Oct. 11..4.46	Jan. 1.....3.40
Corning	1.90	Jan. 1....4.00	June 29....4.20	May 15..4.25	Jan. 1.....3.50
Somerset	1.90	Jan. 1....4.50	June 29....1.00	Oct. 11..4.50	Jan. 1.....3.25
Somerset Light	2.15	Jan. 1....4.25	June 29.... .90	Sept. 23..4.25	Jan. 1.....3.25
Ragland	1.00	Jan. 1....2.60	June 29.... .60	Sept. 23..2.60	Jan. 1.....1.75

CENTRAL STATES FIELDS

Wooster	$2.60	Jan. 1...$4.05	June 27...$1.80	Mar. 10.$4.05	Jan. 1....$3.45
Lima	2.48	Jan. 1....3.73	June 27....1.58	Mar. 10..3.73	Jan. 1.....2.98
Indiana	2.28	Jan. 1....3.63	June 27....1.38	Mar. 10..3.63	Jan. 1.....2.88
Princeton	2.27	Jan. 1....3.77	June 27....1.27	Mar. 10..3.77	Jan. 1.....3.02
Lodi	2.60	Jan. 1....4.00	June 27....1.80	Dec. 4.00	July.....4.00
Illinois	2.27	Jan. 1....3.77	June 27....1.27	Mar. 10..3.77	Jan. 1.....3.02
Waterloo, Ill	1.75	Jan. 1....1.75	June 27.... .75		
Plymouth	1.65	Jan. 1....3.48	June 27.... .65	Mar. 3...3.48	Jan. 1.....2.78
Canadian Petrolia	2.88	Jan. 1....4.13	June 27....1.98	Mar. 10..4.13	Jan. 1.....3.38
Western Ky	1.90	Dec. 1...2.40	June 27.... .58		

MID-CONTINENT FIELDS

Oklahoma-Kansas	$2.00	Jan. 1...$3.50	June 15...$1.00	Mar. 1..$3.50	Jan. 1....$3.00
Hewitt	2.00	Jan. 1....3.50	June 15....1.00	Apr. 8...3.50	Jan. 1.....2.00
Healdton	1.00	Jan. 1....2.75	June 21.... .60	Mar. 1...2.75	Jan. 1.....2.00

Gulf is paying $2.25 for Oklahoma-Kansas crude above 38°.

NORTH TEXAS FIELDS

Burkburnett	$2.25	Jan. 1...$3.50	June 4....$1.00	Mar. 1..$3.50	Jan. 1....$2.75
Electra	2.25	Jan. 1....3.50	June 4....1.00	Mar. 1...3.50	Jan. 1.....2.75
Corsicana, light	1.30	Jan. 1....3.00	June 24.....85	Mar. 1...3.00	Jan. 1.....2.75
Corsicana, heavy	.75	Jan. 1....1.75	June 1..... .85	Mar. 1...1.75	Jan. 1.....1.30
Ranger	2.25	Jan. 1....3.50	June 21....1.00	Mar. 1...3.50	Jan. 1.....2.75
Strawn	2.25	Jan. 1....3.50	June 21....1.00	Mar. 1...3.50	Jan. 1.....2.75
Moran	2.25	Jan. 1....3.50	June 21....1.00	Mar. 1...3.50	Jan. 1.....2.75

NORTH LOUISIANA FIELDS

Caddo above 38	$2.00	Jan. 1...$3.50	June 27...$1.25	Mar. 15.$3.50	Jan. 1....$2.75
Caddo 35 to 37.9	1.90	Jan. 1....3.40	June 27....1.15	Mar. 15..3.41	Jan. 1.....2 65
Caddo 32 to 34.9	1.85	Jan. 1....3.35	June 27....1.10	Mar. 15. 3.35	Jan. 1.....2.65
Caddo, heavy	1.25	Jan. 1....2.50	June 18.... .60	May 10..2.50	Jan. 1.....1.25
DeSoto	2.00	Jan. 1....3.40	June 27....1.15	Mar. 15..3.40	Jan. 1.....2.64
Homer 36 and above	2.00	Jan. 1....3.25	June 27....1.00	Mar. 15..3.25	Jan. 1.....2.50
Bull Bayou	1.90	Jan. 1....3.15	June 27.... .90	Mar. 15..3.15	Jan. 1.....2.50
Crichton	1.75	Jan. 1....3.00	June 27.... .75	Mar. 15..3.00	Jan. 1.....2.25
Haynesville, 34° and above	1.85	Nov.8....1.85	Oct. 1.....85	.....	.....
Haynesville, below 34°	1.75	Nov.8....1.75	July 1.....75	.....	.....
El Dorado (Arkansas), 34 Be' and Above	2.00	Nov.8....2.00	July 1.....90	.....	.....
Eldorado (Arkansas), below 34 Be'	1.75	Nov.8....1.75	July 1.....80	.....	.....

GULF COASTAL FIELDS

Spindletop	$1.25	Jan. 1...$2.50	June 13...$ .80	Apr. 15 $3.00	Jan. 1....$1.50
Goose Creek	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Sour Lake	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Humble	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Batson	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .2.75	Jan. 1.....1.50
Hull		Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Feb. 18...2.00
West Columbia	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 3.00	Jan. 1.....1.50
Edgerly	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Vinton	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Jennings	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Dayton	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Saratoga	1.25	Jan. 1....2.50	June 13.... .80	Apr. 13 .3.00	Jan. 1.....1.50
Somerset (Texas)	1.25	Jan. 26...2.00	May 28....1.25	.....	.....

WYOMING FIELDS

Elk Basin	$1.90	Jan. 1...$3.10	June 27...$1.00	Mar. 16.$3.10	Jan. 1....$2.35
Grass Creek	1.90	Jan. 1....3.10	June 27....1.00	Mar. 16. 3.10	Jan. 1.....2.35
Big Muddy	1.40	Jan. 1....2.75	June 27.... .50	Mar. 16..2.75	Jan. 1.....2.00
Salt Creek	1.40	Jan. 1....2.75	June 27.... .50	Mar. 16..2.75	Jan. 1.....2.00
Lance Creek	1.90	Jan. 1....3.05	June 27.... .95	Mar. 16..3.05	Jan. 1.....2.30
Rock Creek	1.50	Jan. 1....2.85	June 27.... .60	Mar. 16..2.75	Jan. 1.....2.00
Osage	1.90	Jan. 1....3.05	June 27.... .95	.....	.....
Cat Creek, Mont	1.90	Nov. 16..1.90	Oct. 19.....1.50		

CALIFORNIA

SAN JOAQUIN VALLEY AND WHITTIER-FULLERTON FIELDS

Degrees	Price Feb. 27	Degrees	Price Feb. 27	Degrees	Price Feb. 27
14-17.9	$1.10	24-24.9	1.38	30-30.9	$1.95
18-18.9	1.11	25-25.9	1.46	31-31.9	2.05
19-19.9	1.13	26-26.9	1.55	32-32.9	2.15
20-20.9	1.16	27-27.9	1.65	33-33.9	2.25
21-21.9	1.20	28-28.9	1.75	34-34.9	2.35
22-22.9	1.25	29-29.9	1.85	35 and above	2.45
23-23.9	1.31				

Tulsa Market

(Continued from page 101)

December dropped about 50,000 gallons a day from the November output. Output of other products was very nearly at the November rate and stocks increased moderately.

Gasoline

The Union Petroleum Co. continues in the market for 64 gasoline 390 end point for export. It has bought all of this product available practically since December and has moved at the rate of a few hundred cars a month from the Mid-Continent district. This has practically eliminated the 60 gravity product, and one company which is in the market for this grade with an end point of 400 is having trouble to fill its requirements.

Although Navy can be bought for immediate movement at perhaps a shade under 14 cents, few if any refiners will quote this figure for movement over any part of March. There has been little active purchasing over the week end. There are some indications of jobbers putting inquiries into the market with the idea of buying for storage, but little actual movement of stuff has developed.

Optimism pervades the natural gasoline market as inquires have gathered in volume during the past few days. Prices have continued to strengthen, particularly as the demand for quotations over March has been growing more insistent.

Manufacturers are still holding back and refusing to quote over any extended period, or quoting a price for 30-day delivery which the buyers will not consider. As a result, the spot market has been brisk and small shipments have been the rule.

February stocks are reported to be virtually expended and the manufacturers, with few exceptions, are claiming to be on a current basis.

Lubricating Oils

With the exception of one outstanding purchase, movement of lubricating oils from the district has been light during the past week and a tendency to weakness is seen. The Barnsdall Oil Corp. sold 60 cars of cylinder stocks to the Union for export, which is moving in trainload lots. One train of 25 cars moved for Westwego last Monday and a second train billed for the same place moved Saturday.

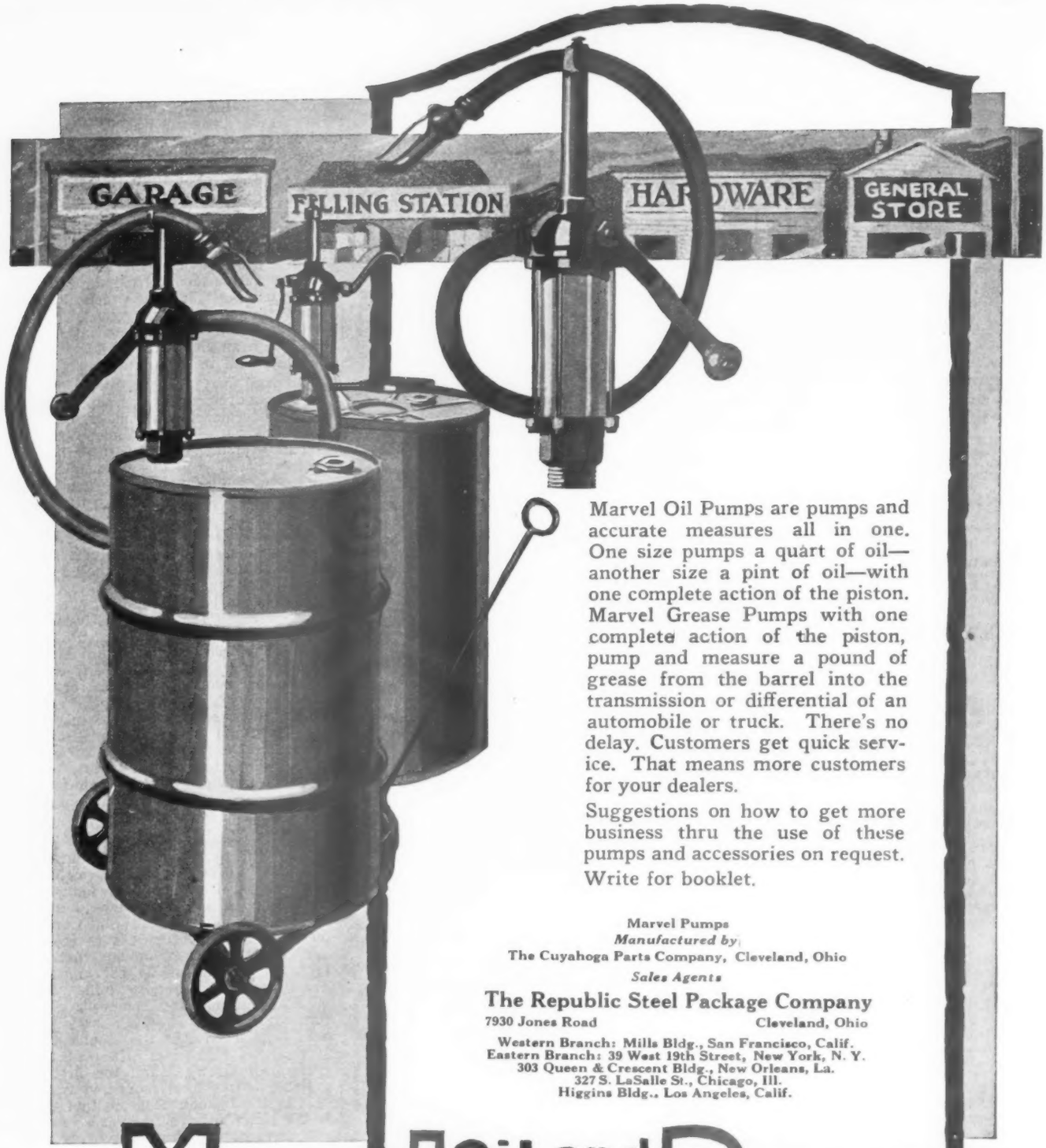
It is believed that the shipment is the largest for that class of stocks in the history of Group 3 and the first where cylinder stocks have moved in train lots.

It is the opinion of some that the sale to the Union may be taken as a forerunner of others of magnitude for export, which will have a tendency to strengthen the market.

The same tendency on the part of the refiners to hold products for the spot market is seen in lubricating oils. The refiners appear to have confidence in the future for the stuff. One buyer complained that he could not induce a refiner to sell over a period of a year, even at an advance of from 5½ to 6 cents over the market.

Fuel and Gas Oil

The fuel oil market has receded from its high point of two weeks ago when some refiners were asking $1 on an anticipated demand because of the possibility of a coal strike. There was some buying to meet strike needs, but the idea of a coal strike seems to be taken less seriously now than a few weeks ago.



Marvel Oil Pumps are pumps and accurate measures all in one. One size pumps a quart of oil—another size a pint of oil—with one complete action of the piston. Marvel Grease Pumps with one complete action of the piston, pump and measure a pound of grease from the barrel into the transmission or differential of an automobile or truck. There's no delay. Customers get quick service. That means more customers for your dealers.

Suggestions on how to get more business thru the use of these pumps and accessories on request. Write for booklet.

Marvel Pumps
Manufactured by
The Cuyahoga Parts Company, Cleveland, Ohio
Sales Agents

The Republic Steel Package Company
7930 Jones Road Cleveland, Ohio

Western Branch: Mills Bldg., San Francisco, Calif.
Eastern Branch: 39 West 19th Street, New York, N. Y.
303 Queen & Crescent Bldg., New Orleans, La.
327 S. LaSalle St., Chicago, Ill.
Higgins Bldg., Los Angeles, Calif.

Marvel Oil and Grease Pumps
Republic Steel Barrels

NOTICE!

As stated in previous issues, The Cuyahoga Parts Company are the original designers of Marvel Oil & Grease Pumps, with patents pending. Any litigation that may be pending will be litigation instituted by The Cuyahoga Parts Company, just as soon as patent issue is decided. Any statement contrary to the above is a plain misrepresentation and we have faith to believe there are still sufficient fair-minded business men who can decide that issue on facts presented.

The only authorized distributors at this time are The Republic Steel Package Company and its agencies and the manufacturer.

OIL FINANCE

Oil Shares Continue Strong

THE bull movement that has prevailed in Wall street for several weeks, continued throughout last week and the shares which have shown the greater strength, carried on for substantial gains. Trading was heavy during the five days of business and although Mexican Petroleum, as usual, held the chief interest of the speculative element, California Petroleum displayed the greatest strength and the net advance of 4⅝ points for the week brought this stock to a new high for the year at 53.

Pacific and Texas & Pacific Coal & Oil also took part in the activity that revolved about California Petroleum and new highs for the year were recorded at 48⅞ and 27⅜, respectively. This bullishness however, did not extend to Standard of California. It closed the week ½ point off. Trading in oil shares was heavier for the five-day week than for some time past and with the exception of the usually weak stocks, the advance was general.

Royal Dutch and Shell Advance

Royal Dutch and Shell Transport each advanced and the latter touched a new high for 1922 when it hit 42. Houston, Cosden, Pure Oil, Pan-American and Pan-American series B shares all gained more than a point.

The bear movement which was directed at Mexican Petroleum at the end of the preceding week was overcome. This reaction came about with the explanation by company officials that the dropping of two letters in a geologic word led the street to believe there had been further salt water encroachments in its Mexican wells. Some selling activity also was created by an opinion expressed at the oil symposium of the American Institute of Mining and Metallurgical Engineers that there was little hope for the present Mexican oil fields. This expression however, did not disturb the shares of Pan-American which holds 71 per cent of the common and 75 per cent of the preferred of Mexican Petroleum, as both classes of Pan-American held well above the preceding week's range.

Island Falls in Selling Movement

Considerable selling of Island, following unfavorable reports as to the company's financial condition, brought these shares to another new low at 1½. Pierce common and preferred both touched new lows, the latter selling off 14 points in two weeks.

Kirby Petroleum was the center of the week's interest on the New York Curb and during the sale of 44,900 shares, the stock was carried to a new high for 1922 at 26½. National Refining at 38½ was a new high on the Cleveland Exchange.

There was a general shading off in the unlisted Standard Oil stocks and the decline was led by South Penn following the 50 per cent reduction in the dividend for the first quarter of 1922. South Penn's bid quotation fell from 185 to 165 but an odd lot was sold on the Curb for 170 after the dividend announcement.

Foreign Exchange Prices Rise

Foreign exchange, with the exception of German marks, was marked by the continued upward movement. Demand sterling reached $4.41 3/16 on Feb. 23, the highest since July 19, 1919, and French francs sold at 9.16¾ cents the same day which also was a new high for the movement. The chief rise in francs is attributed to a speculative interest in Paris and a decrease in French importations. The week closed with slight recessions from the high figures.

The Feb. 22 statements of the Federal Reserve Banks showed an increase in the reserve ratio from 76.4 per cent to 78.1 for the week. This compares with 49.9 for the corresponding week a year ago and shows to what great extent the country has recovered financially.

Call money in New York ranged from 6 to 4½ per cent during the week with 5 the ruling rate. Time loans were made at 5 and 4¾.

Financial Notes

Societe Generale des Huiles de Petroleo—Capital to be increased from 100,000,000 francs to 227,000,000 francs (about $20,700,000 at present exchange rates, normally $43,811,000). This company was formed a year ago as the refining and marketing organization in France of the Anglo-Persian Oil Co. which subscribed to 45 per cent of the capital. The Anglo-Persian has guaranteed a large percentage of the new issue.

Humphreys Mexia Co.—Special meeting of stockholders called for March 6 to vote on changing name to Humphreys Oil Co. and increasing capital from $10,000,000 to $15,000,000, divided into 600,000 shares of $25 each. Humphreys Texas Co. stockholders will meet same day to vote on dissolution of company and transfer of company's assets on such terms as they decide upon at the meeting.

Richfield Consolidated Oil Co.—The following officers were elected at a meeting in Los Angeles: W. R. Dickinson, president; J. M. Harlan, vice president; F. W. Blanchard, treasurer; F. J. Marks, counsellor; Edward G. Peck, secretary. The company has five producing wells; well No. 6 is drilling at 1700 feet, and the derrick for No. 7 is being erected.

Middle States Oil Corp.—Turman Oil reports income of $311,905 and expenses of $83,056 for the last four months of 1921 after control passed to Middle States. During the period the company paid out $67,623 at the rate of 1 per cent monthly on its $2,254,618 capital stock.

Magnolia Petroleum Co.—Annual beeting of stockholders to be held at 11:30 a. m. March 14 in the bank building of Hutchins, Sealy & Co., Galveston, Tex. The company announces transfer books close March 3.

Pennok Oil Co.—Dividends of $1 on stock of $10 par declared for each of four quarters of 1922. Last dividend was in October, 1919, when 2½ per cent was paid, making a total of 5 per cent that year.

Island Oil & Transport Corp.—Many rumors have been current in Wall street regarding the company's financial conditions and these stories have been followed by heavy selling of this stock, resulting in a new low for the year. The company issued this statement: "Island's shipments of produced, stored and purchased crude oil for January amounted to 707,183 barrels. There has been no appreciable diminution in produced oil during the last 30 days."

Mexican Petroleum Co.—An unusual explanation is given for the break

in Mexican Petroleum prices Feb. 17, when, after reaching a new high for the year at 126½ the shares fell off almost 8 points. The advance was made on a report that a record breaking well had been brought in at Tierra Blanca. The day following there was current a story that one of two wells in that field had turned to salt water. Company officials explained that one well had been abandoned because basalt rock had been struck and that, evidently, bears in the street had dropped the first two letters of basalt and the report spread that salt had been struck. Subsequently the stock recovered greatly making a high of 123½ for the week.

Eagle Shareholders Receive Good Reports

NEW YORK, Feb. 24.—The Mexican Eagle Oil Co., Ltd., had a surplus of $55,945,426 (Mexican gold pesos, value 49¾ cents in U. S. gold) at the end of the fiscal year, June 30, 1921, according to the report made to stockholders at the annual meeting in Mexico City in January. Profit from trading amounted to $81,982,299 of which $16,236,472 was transferred to the field redemption and depreciation reserve accounts. To this was added $3,338,129 interest, and a profit and loss balance of $3,814,189 from the preceding year. To the legal reserve account was transferred $3,379,197 and $1,500,000 to the provident fund. Dividends of 11 per cent on each of the 12,082,761 ordinary shares and 850,000 8 per cent preference shares outstanding amounted to $12,073,521.

It was proposed to apply the surplus as follows: Dividend of 19 per cent on preference shares, making 30 per cent for the year, $1,615,000; 19 per cent dividend on ordinary shares, $22,957,245; transfer to general reserve accounts, $30,000,000, and $1,373,181 balance carried forward to 1922. All of the foregoing amounts are in Mexican pesos.

The profit on trading shows an increase of about 45 per cent over that of 1919-20. The balance sheet for the year shows:

ASSETS		
Real estate, fixed plant and equipment, etc.	$91,153,256.52	
Less depreciation reserve	20,726,278.56	
		$70,426,977.96
Private subsoil rights, federal and state concessions	$29,347,998.66	
Exploration and field expenditures, equipment on fields	35,730,218.36	
	65,078,217.02	
Less redemption account	64,078,217.02	
		1,000,000.00
Loose plant and equipment		5,139,258.77
Floating craft less depreciation		3,777,439.88
Investments in allied Companies		46,946,612.28
Stocks of oils, stores		44,848,492.15
Debit balances, less reserve for doubtful items and cash		71,293,767.86
Total assets		**$243,432,548.90**
LIABILITIES		
Capital issued		$129,327,610.00
Reserves		38,290,664.87
Provident fund		3,210,769.83
Creditors and credit balances		9,028,319.52
Shareholders for dividends declared		7,629,757.75
Profit and loss account—Balance from last year	$ 3,814,189.52	
Profit and loss,—balance for year ending June 30, 1921	69,083,956.33	
Deduct provident fund, legal reserve account and dividends	16,952,718.92	
		55,945,426.93
Total liabilities		**$243,432,548.90**

Indiana Pipe Line Co. Gains In 1921 Earnings

NEW YORK, Feb. 25.—The net earnings of the Indiana Pipe Line Co. in 1921 increased more than $150,000 over the 1920 earnings, the annual income statement shows. The income account for the year ended Dec. 31, follows:

	1921	1920
Net Earnings	$1,163,550	$958,301
Dividends	800,000	800,000
Surplus	**$ 363,550**	**$158,301**

The net earnings were $89,866 more than those of 1919. The balance sheet as of Dec. 31, shows:

ASSETS	1921	1920
Pipe line & plant	$5,381,383	$5,334,384
Materials&Supplies	131,547	89,858
Cash, investments, etc.	6,253,401	5,484,479
Total	**$11,766,321**	**$10,908,722**
LIABILITIES		
Capital stock	$5,000,000	$5,000,000
Accounts payable, including tax & insurance reserve	1,108,299	727,146
Depreciation reserve	2,275,023	2,142,131
Surplus	3,282,999	3,039,448
Total	**$11,766,321**	**$10,908,722**

California Holders Of Union Oil Organize

By Special Correspondent

LOS ANGELES, Feb. 24.—More than 40 per cent of the outstanding stock of the Union Oil Co. of California has been committed to the holding company plan, which is being promoted by California shareholders to prevent the further intrusion of foreign capital with the possible passage of control into the hands of extra-California interests.

The Union Oil Co. of Delaware which is allied with the Royal Dutch-Shell interests in the new Shell Union Oil Corp., owns 27 per cent of the stock of Union of California.

Forty per cent of the outstanding capital has been set as the minimum amount of stock to be incorporated in the holding company but the backers of the plan hope to have more than 50 per cent represented. Members of the proposed board of directors of the holding company include: Lyman Stewart, chairman of the board of Union; W. L. Stewart, president of Union; E. W. Clark, vice president and general manager; Henry M. Robinson, Isaac Milbank, both directors; George L. Cochran and William R. Staats.

Completion of organization of the holding company has been set for not later than March 31.

1922 North American Dividend is Predicted

By Special Correspondent

OKLAHOMA CITY, Feb. 23.—Three directors were re-elected at the annual meeting of the North American Oil & Refining Corp, here Feb. 21. They were: M. H. Warren, vice-president and general manager of the corporation; C. J. Webster, of New York, and Samuel Thorne, Jr., of New York. Mr. Webster is president of the Noco Petroleum Co., which through a subsidiary, the Puritan Petroleum Co., purchased all unissued stock of the North American last November.

J. E. McDonnell, of Des Moines, Ia., also representing Puritan interests, recently was elected a North American director succeeding Elias Mayer, of Chicago, resigned.

President C. F. Colcord, in his annual report, said the corporation weathered the 1921 depression last year and the Puritan arrangement in November put the corporation in splendid financial condition.

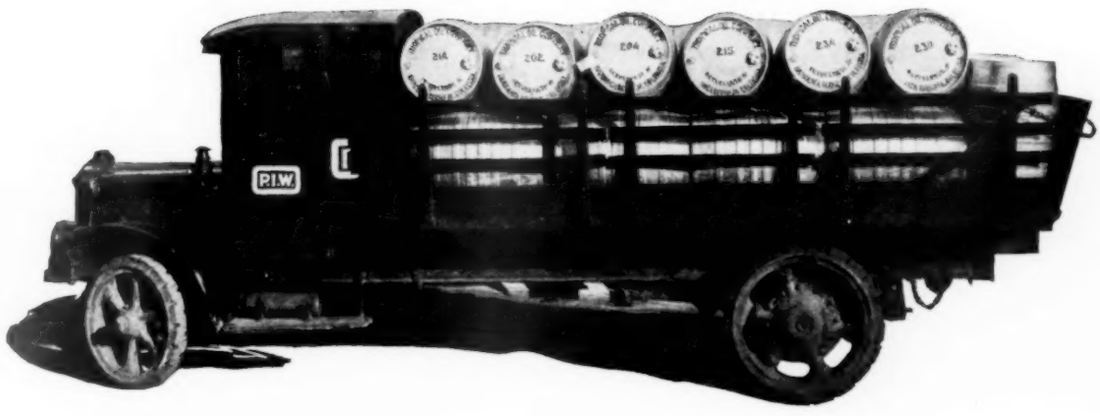
D. I. Johnston, vice-president, said the market quotations on North American stock are less than one-third the book value of the stock, and also predicted that with earnings steadily increasing, the North American will resume payment of dividends this year. The financial statement as of Dec. 31, 1921, was given as follows:

ASSETS	
Cash	$ 68,671.80
Notes and accounts receivable	336,626.51
Inventories	3,285.78
Prepaid insurance, interest	16,464.65
Treasury stock	16,595.00
Refineries, tank cars, pipe lines, leaseholds and development, Miscellaneous equipment	5,943,078.50
Deferred charges	92,986.71
	$6,477,708.95
LIABILITIES	
Notes and accounts payable	$454,782.42
Deferred credits	75,386.35
Tank car trusts	497,904.30
Bonds outstanding	376,750.00
Reserve for taxes, depreciation	440,868.54
Capital stock outstanding	3,879,070.00
Surplus	752,947.34
	$6,477,708.95

Oil Dividends

Pennok Oil q.	$1	Mar. 31	Mar. 15
Chesebrough Mfg. q.	3½	Mar. 31	Mar. 10
Cheseb'gh Mfg. pf. q.	1¾	Mar. 31	Mar. 10
Continental Oil q.	2	Mar. 15	Feb. 28
Phillips q.	$.50	Mar. 31	Mar. 15
Nat. Transit ex.	$.50	Mar. 15	Feb. 28
Galena Signal pf. q.	2	Mar. 31	Feb. 28
Galena Signal B pf. q.	2	Mar. 31	Feb. 28
Tex-Pac C.&O. q.	$.25	Mar. 31	Mar. 21

P.I.W.
STEEL PLATE CONSTRUCTION



A Load of "GEM" Barrels for South America

Consigned to Colombia, South America, the above truck load of "GEM" Bilged Barrels was photographed as it was leaving our shipping department a few weeks ago. These will be used for transporting refined oils, gasoline and other Petroleum Products throughout the Southern Continent.

The "GEM" Bilged Steel Barrel has proved a popular package with the trade for hard service. It is manufactured with the latest improved machinery in a modern well-lighted shop—furnished either black or galvanized. Length over all—34 inches. Diameter at bilge—24½ inches.

"Presteel" I. C. C. Drums	30, 55 and 110 gallon capacities
"Presteel" Light Gauge Drums	15, 30, 50 and 55 gallon capacities
"Presteel" Special Drums	150 and 175 gallon capacities

THE PETROLEUM IRON WORKS COMPANY

Pressed Steel Products Dept.
SHARON, PA.

New York St. Louis Houston Tampico Tulsa Denver San Francisco

P.I.W. Steel Plate Products are used in the Petroleum, Gas, Chemical, Mining, Railway, Iron and Steel, Water Works, Engineering and Allied Industries.

How Oil Shares Moved Last Week

New York Stock Exchange

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng Feb.18	Week's High	Week's Low	Close Feb. 24	Net Ch'ge
19⅜	7¾	12¼	10¼	$100	Caddo Oil	1,000	....	11	10⅜	11	+ ⅜
50¾	25	50½	43⅜	100	Calif. Pet.	16,700	48	†53	48⅛	52⅝	+4⅝
44⅞	22½	36¾	31⅝	N.P.	Cosden & Co.	17,900	34	36	34½	35½	+1½
78⅜	39½	65¾	55⅛	100	General Asphalt	36,600	60¼	64⅛	61¾	62½	+ ½
86	40½	77⅞	70	100	Houston Oil	8,100	75	77	75¼	76¼	+2
15¾	6½	....	....	10	Indian Ref.	1,700	9	9⅛	8¾	....	....
26	5½	15⅞	12⅝	50	Invincible Oil	28,200	14¼	15½	13⅞	13⅞	+1½
4¾	2	3	1½	10	Island Oil	71,800	2¼	2	*1½	1½	− ⅜
30⅞	12⅝	29	22⅝	N.P.	Marland Oil	2,900	26½	27	26	26½	+1
167¼	84½	126½	106¾	100	Mex. Pet.	101,000	110¾	123⅞	118¾	122½	+3
16½	10	13¾	11⅝	10	Mid States Oil	32 600	13⅛	13½	12⅞	13¼	0
4	1¾	2¾	2¼	5	Ok. Prod. & Ref	5,700	2½	2½	*2¼	2¼	− ¼
50⅜	27½	48⅞	44⅜	N.P.	Pacific Oil	31,600	46¾	†48⅞	46½	47⅞	+1⅜
71¾	38⅛	56⅝	48⅞	50	Pan-American Pet	26,200	53½	55½	53	55	+2
79⅜	34⅛	52	44	50	Pan American B	6,500	49¾	50	47¾	50	+2¼
34½	16	33⅝	29¼	N.P.	Phillips Pet.	4,000	31⅞	33½	31¾	32½	+ ¼
14⅞	5¼	12¼	7⅜	25	Pierce Oil	14,800	7¾	8½	*7⅜	8½	+ ⅜
78	30½	71	47	100	Pierce Oil pf.	3,400	47	48	*47	....	....
34½	20⅜	30¾	24⅛	50	Prod.& Ref.	1,500	26½	27	26⅛	27	....
40⅜	21½	38⅝	33⅛	25	Pure Oil Co.	5,100	33⅝	35⅛	33½	34¾	+1⅛
69⅞	40½	52¾	47¼	13.40	Roy Dutch N. Y.	21,900	51	52¾	50⅝	52½	+1⅞
49	30⅞	42	35⅝	2	Shell Transport	,900	39⅜	†42	39⅛	....	....
28⅜	16⅛	21⅞	18¾	N.P.	Sinclair Consol.	35,200	19	21	19	21	+2
98½	67¾	98½	91	25	S. O. California	8,700	94½	97¾	95¼	95¾	− ½
102¼	124½	183	169¼	25	Stand Oil N. J.	1 500	178	179⅞	176¼	178½	+1
114½	104¼	115⅞	113⅜	100	do	2,500	....	†115⅞	115⅛	115¾	+ ⅝
13¾	3¼	6⅝	5	N.P.	Superior Oil	3,400	5⅜	5¾	*5	5½	+ ¼
48	29	46¾	42¼	25	The Texas Co.	34,600	45⅛	46¼	45	45⅝	+ ½
36⅞	19¼	27⅜	23	10	Tex. Pac. C & O	17,200	25½	†27⅜	25⅛	27	+2
13	6	11	9½	N.P.	Transcont. Oil.	17,200	9⅝	10	9¾	10	+ ⅛
25½	15⅛	20⅝	17½	N.P.	Union Oil	11,300	19¼	19½	17½	18¼	− ⅞
17⅜	7	10⅜	7½	N P.	White Oil	6,600	9¼	9⅝	9⅛	9⅛	− ⅜

†New High
*New Low

New York Curb Market

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng Feb.18	Week's High	Week's Low	Close Feb. 24	Net Ch'ge
10¾	3½	4¼	3¼	25	Carib Synd.	4,200	3¾	4	3¾	3¾	
31½	11¼	21¼	17	N.P.	Cities Ser. Bkrs.	2,932	18½	19⅛	18½	19⅛	+ ⅛
2¼	1⅛	1⅛	1	5	Federal Oil	16,000	.....	1⅛	1	1	−⅛
2⅛	1	1⅜	.83	10	Glenrock Oil	11,600	.....	.98	.86	.90	− 1
24	1	8½	4	N. P.	Gilliland	7,300	8	8	6⅞	7¾	
17¾	9⅛	17⅛	14¼	5	Inter. Pet.	11,600	14⅝	15⅛	14	15	.....
18½	15¾	26½	14¼		Kirby Pet.	44,900	....	†26½	23¾	25⅛	
15⅝	6¾	10⅜	8⅛	10	Merritt Oil	800	8⅝	8¾	8½	8¾	+ ¼
36	33	42	28½	N. P.	Mex. Seaboard	1,000	.....	29½	29⅛	.....	
....	.....	12⅜	9⅞	10	Mountain Prod.	2,600	.....	12	11⅝	11¾	
3¼	1	2¼	1½	5	N. Amer. Oil	800	.....	1⅞	1¾	.....	0
7	3	6	4¾	10	Pennok. Oil	2,500	.....	6	5⅝	5⅞	+ ¼
6⅝	2⅝	6	4½	10	Prodrs & Refrs.	300	5⅜	5⅞	5½	5⅞	
5⅛	2¾	3¼	2⅜	5	Sapulpa	900	...	3	2¾	2¾	....
15⅜	9¼	14½	12½	10	Salt Creek Prod.	2,100	13¾	14	13¼	13⅝	+ ⅜
13⅜	5¼	12⅞	9⅜	N.P.	Simms Pet.	7,100	10¾	10⅞	10⅛	10⅜	− ¼
9½	2½	5½	4¾	10	Skelly	4,100		5⅛	5	5	

†New High
*New Low

Pittsburgh Stock Exchange

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng Feb.18	Week's High	Week's Low	Close Feb. 24	Net Ch'ge
19	6½	10½	7	10	Arkansas Nat. Gas	4,340	9¼	9½	8⅝	8⅝	−⅝
26	16¾	24½	20	25	Lone Star Gas	350	23½	24¼	23¼	23¾	+¼
53	42	47½	45⅝	50	Man. Light & Heat	400	47	47¼	46¼	46¼	−¼
3⅝	1¼	2⅝	2¼	5	Marland Refining	25	2⅝	2⅜	2⅜	2⅜	−¼
30¾	17½	21	19	25	Okla. Nat. Gas	525	20	20½	20¼	20½	+½
24	11½	19	16	1	Ohio Fuel Oil	235	17	17	16⅞	16⅞	−⅛
50	40	48½	44½	25	Ohio Fuel Supply	432	47½	47⅞	47	47	+⅜
.....	.....	10¾	8¼	10	Salt Creek Con.	1,565	10	10¼	9½	9½	−½
27	25	29⅞	6⅜	N.P.	Tidal Osage Oil						
5	16	11	12	9¼	Pittsburgh Oil Gas	30	7	7	7	7	
120	107½	119	115½	100	Union Nat. Gas	100	118½	118	118	118	−½
66	60	76¼	64½	100	Columbia Gas	275	.....	†76¼	75	75	....
16⅛	10⅞	13⅛	13⅛	10	Middle States	10	.....	13⅛	13⅛	13⅛	....

†New High

Pittsburgh Curb Market

1921 High	1921 Low	1922 High	1922 Low	Par Value		Week's Sales	Op'ng Feb.18	Week's High	Week's Low	Close Feb. 24	Net Ch'ge
3½	1	3⅜	2	5	Duquesne Oil	605	2⅝	2¾	2⅝	2⅝	.....
.24	.05	.09	.06	1	Homer Union Pet.	1,500	.06	.06	.05	.05	−.01
.45	.16	.35	.20	1	Mex.-Wyo. Oil	3,100	.20	.23	.20	.23	+.03
.12	.01	.06	.03	1	Twin City Oil						
7	2	1½	1⅜	10	Columbia Synd.	300	1⅜	1½	1⅜	1⅜	.....
11½	5	7	7	10	Marshall Oil	20	7	7	7	.. ....	.....

Standard Oil Stocks

Standard Oil securities are dealt with to only a small extent on the New York curb market, the great majority of sales being made over the counters of investment bankers. For this reason no record can be obtained of the total volume of sales from day to day to indicate the activity of any particular stock. Below are bid and asked quotations prevailing on the curb market at the close of business on the date given, the same quotations prevailing in the majority of unrecorded transactions:

	Feb. 24 1922 Bid	Asked	1921 High	Low
Anglo-American	17¼	18	22	14
Atlant.cRefg.	950	970	1225	820
BuckeyePipe	91	93	88	70
Continental Oil	128	132	128	100
Galena Signal	48	51	53	29
Illinois Pipe	172	176	195	140
Ohio Oil	265	270	300	222
Penn-Mex	22	22½	29	17½
Prairie Oil & Gas	530	540	598	385
Prairie Pipe	237	242	242	155
South Penn	165	175	266	150
S. O. Indiana	86¼	86¾	93⅞	60¾
S. O. Kansas	510	530	635	520
S. O. Kentucky	450	465	445	90¢
S. O. New York	355	360	393	725
S. O. Ohio	375	390	429	665
Union Tank Car	93	98	116	89¾
Vacuum Oil	337	340	355	35½

Unlisted Securities

By Carl H. Pforzheimer & Co.

	Par Value	Feb. 24 1922 Bid	Asked	1921 High	Low
Gulf Oil Corp	$100	345	355	392	360
Humble Oil & Refg	100	200	210	261	250
Magnolia Petroleum	100	150	155	165	110

Miscellaneous Stocks

The following are bid and asked prices ruling at the close of business on the date given, on the stock markets indicated by reference mark, with high and low levels reached so far this year:

	Par Value	Feb. 24 1922 Bid	Asked	1921 High	Low
Cities Serv (a)	$100	175½	176½	256	101
do p'f'd (a)	100	54⅜	55⅜	71	35
Ntl. Refg (a)	25	38	38½	26½	45
do. pfd. (a)	100	115	....	118½	107
Par. Refg. (a)	25	11	11¼	25½	9½
do pfd. (a)	100	50	80	96	95
Ind'homa Refg (b)	5	3.75	4.00	7⅛	2
Marland Refg. (b)	5	2.37	2.50	30⅞	12½

(a) Cleveland (b) St Louis.